MAR 8 1926

PAPER TRADE JOURNAL

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Vol. LXXXII, No. 9 — MARCH 4, 1926 — Per annum, $4.00 Per copy, 15 cents

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ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

Vol. LXXXII, No. 9 [redacted] Thursday, March 4, 1926

The Magazine of the Paper Industry

Natural Resources Tax Foreshadowed in Quebec

Pulpwood Consumption and Hydro Electric Energy May Be Taxed for Educational Needs—Proposal, Considered Unfair by Paper Interests, to Be Bitterly Fought—New News Print Machine at Three Rivers Plant Begins Production —International Paper in New Brunswick

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 1, 1926.—It is announced here that in order to provide for the increased needs of education in the Province of Quebec, the Provincial Government is considering the imposition of a new tax, to be called the Natural Resources Tax, and to be levied on the consumption of pulpwood and on the development of hydro-electric energy. The pulpwood tax (which, by the way, Premier Tarchereau foreshadows in his recent address at the annual banquet of the Pulp and Paper Association in Montreal), will, it is stated, be at the rate of 10 cents per cord. The exact rate per horse-power on hydro-electric energy is not yet determined. It seems likely that the tax will be levied both on leased and privately owned water powers and timber limits, though whether the small farmers' wood will be included is another matter.

As the consumption of pulpwood by Quebec mills, to say nothing of the pulpwood exported will shortly amount to 2,500,000 cords a year, the tax, if enacted, will impose a burden of $250,000 on the industry. Already there is evidence that both this tax and the tax on hydro-electric energy will be strenuously opposed, the argument being that it would not tax natural resources, but the special business of developing them; further that it would be confiscatory, as it would impose on leaseholders a condition not contemplated when they acquired their leases; and that it could not effectively be imposed on future lease-holders, as they would naturally deduct the value of the taxation from the price that they would offer for their leases. The proposal will also be fought on the ground that the principle involved, of taxing a special business for the general interests, is both unfair and unjust.

Prohibition of Hydro Electric Export

Implementing his promise at the opening of the Quebec Legislature Assembly, Premier Tarchereau has introduced his measure to prohibit the export of hydro-electric power developed in the Province of Quebec. The Bill provides that "every sale, lease or grant whatsoever of water powers, belonging to the province, or in which it has rights of ownership or other rights, made on or after the coming into force of this act, shall contain a clause prohibiting the exportation, outside of Canada, of the electric power which may be developed in this province."

It is next provided that "every contract, permit or grant authorizing, from and after the same date, the installation or passage of transmission lines, in or over the Crown domain, shall likewise contain a similar prohibitive clause."

To insure enforcement, the bill decrees that "every violation of the provisions of this act shall render null and void, at the demand of the Crown, any sale, grant or contract, any lease or permit, made or granted by it," and, further, that the provisions of the act are to apply to existing contracts, unless reported to the minister of lands and forests within three months after the coming into force of this act, and to any renewal of such contracts, at the expiration of the term for which they were made."

Grounds for Legislation

The grounds for this legislation are stated in the preamble of the Bill, wherein it is stated that:

"Whereas, the province contains numerous waterfalls suitable for the development of electric power;

"Whereas, by industrial development and the increase in domestic needs, the application of electric power is becoming more considerable every day;

"Whereas, coal, oil, wood and other fuel are daily becoming more difficult to obtain and more expensive;

"Whereas, the industrial, commercial and economical development of the province indicates that in the near future all the water powers which are the most accessible and the least costly to operate will be utilized;

"Whereas, once exportation of electric power is permitted, it can seldom be stopped or suspended without giving rise to serious difficulties:

"Whereas, it is in the best economical interests of the province, of the promotion of its industry and commerce, to attract capital and create industrial centres therein, in which workmen would find employment, thereby stopping emigration, and in which farmers would find markets for their produce;

"Whereas, the prohibition to export electric power in the cases hereinafter determined will constitute an important factor to assist in attaining these objects, it is, therefore, expedient to enact provisions to that effect."

New News Print Machines

It is stated that the two new news print machines for the Port Alfred Corporation (already announced in these columns) will have a rated capacity of between 115 and 125 tons each per day, which added to the output of the two present machines, will give a total capacity of 450 tons of news print daily. The first new machine is expected to be in operation by May.

The first of the four new news print machines being installed by the International Paper Company in its Three Rivers plant has just commenced production. It made the first ten tons of news print at a speed of 800 feet of paper a minute without a break, which is thought to be a record. An innovation is the use of worm gears to drive the machinery, thus lessening vibration. It is ex-

(*Continued on Page 44*)

Wisconsin Mills Guilty of Stream Pollution

After an Exhaustive Study Wisconsin Railroad Commission Hands Down an Opinion Against Flambeau Paper Co. In Test Case—Banquet is Given at Marinette For Aaron Pareira Retiring President of the Victory Bag and Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 1, 1926.—What has been characterized as the most exhaustive study ever made of the entire question of stream pollution from a legal and from an economic point of view was embraced in the Park Falls pollution decision and opinion handed down by the Wisconsin Railroad Commission February 20.

The decision holds that Wisconsin paper mills by dumping deleterious waste materials into streams are violating the common law and section 29.29 of the statutes.

The Flambeau Paper Company of Park Falls was chosen in the test case brought by the railroad commission because it held that the absence of any pollution of the Flambeau River below Park Falls is attributable solely to sewage and paper mill waste. Other paper mills of the state were notified of the action when it was started so that they might profit by the information disclosed during the investigation.

What the Wisconsin Law Says

The Wisconsin Statute, Section 29.29, says:

"No person shall cast, deposit, or throw overboard from any boat, vessel, or other craft into any waters within the jurisdiction of the state, or deposit or leave upon the ice thereof until it melts, any fish offal; or throw or deposit, or permit to be thrown or deposited into the waters within the jurisdiction of the state any lime, tanbark, ship ballast, stone, sand slabs, decayed wood, sawdust, sawmill refuse, planing mill shavings, or any acids or chemicals or waste or refuse arising from the manufacture of any article of commerce, or any other substance deleterious to fish life other than authorized drainage and sewage from municipalities."

Common Law Rights Violated

It was also declared that the common law rights of the public were being violated, since the right of fishing in public waters has been found to be a public right which may be enforced by injunction restraining such pollution of public waters as render them unfit for fish to live in.

It was stated in the argument of the case that in the Flambeau River 25 to 30 tons of fish died in one month last summer due to the lowering of the oxygen content of the water.

Evidence was shown of the fibrous refuse from mills settling at the bottoms of the streams to form a sludge preventing spawning and the proper growth of marine life. This was remedied by orders from the commission to screen out such fibrous materials.

The commission held that the state must preserve to the public forever the common rights of fishing, navigation, bathing, recreation, hunting. Statutes authorizing municipalities to erect, maintain and operate sewage disposal plants were adjudged not to authorize stream pollution to the extent of interference with public or private rights.

Right to Sue and Collect Upheld

The right of those suffering from stream pollution to sue and collect damages was upheld. The relative importance of such legitimate uses of streams as for "drinking water, watering stock, irrigation, propagation of fish, disposal of waste and sewage, and, production of power, transportation, fishing and recreation cannot be fixed by rules but depends largely upon the nature of the stream and the character of the development within its drainage rights," according to the decision.

It was further set forth that at the present time there are no streams in Wisconsin which may legitimately be used for the disposal of wastes to the extent of interfering with public rights. Testimony divulged, as far as fish life is concerned, that "during warm weather pollution of waters is very much more serious in its effect on fish life than during cold because the oxygen of the stream is used up more quickly by the faster decomposition of the organic matter, and for the further reasons that warm water will retain less oxygen in solution than cold, and that the tolerance of fish is greater in cold than warm water."

In studying the sources of pollution; it was clearly shown that cheese factories led all the rest in number though not necessarily in seriousness. Milk receiving stations, creameries, public sewerage systems, canning plants, packing and rendering plants, tanneries and condenseries were also listed as sources of pollution.

It developed in the study of fish mortality that the commercial value of fish taken from Wisconsin streams in 1924 was $754,000, though this was cited as but a fraction of their value to the state. This was partly because fish in Wisconsin streams are said to be among the greatest inducements that attract tourists, and tourists spend $100,000,000 annually in Wisconsin, according to the state highway department.

Dealing Specifically with Paper Industry

Dealing specifically with the paper industry, the Park Falls case showed Wisconsin to be fourth in rank among the states of the Union in the production of paper, and that the state has 59 mills controlled by 49 concerns with the annual products valued at $100,000,000.

Whereas the commission definitely ordered the elimination of fibrous waste materials heretofore dumped into the streams by paper mills, it held in abeyance any exact order regarding the sulphite liquor which it declares has proven dangerous to marine and fish life. This was because to date no scientific method for disposing of such liquors has been developed.

Investigation in Pennsylvania has indicated that they may be used for making alcohol, road binders, core binders tanning extracts and other suitable by-products. Some progress has also been made in developing a system to burn the dried refuse.

The present status of the paper industry stream pollution situation is that a committee has been appointed to cooperate with federal and state officials in a program of research to eliminate pollution by extra-legal methods.

Aaron Pareira Honored

One hundred and fifty of the Victory Bag and Paper Company employees assembled in the Blue Room in a Marinette hotel last Saturday evening to pay honor to the retiring president, Aaron Pareira, who recently disposed of his interest in the company.

By Mr. Pareira's transfer of stock February 16 to the Continental Bag and Paper Company of New York, the latter firm becomes sole owner of the Marinette plant. It also owns the Marinette and Menominee Paper Company plant in the same city.

Herman Elsas, president of the eastern concern, will be in Marinette shortly to make an inspection of the plant. The

(*Continued on page 76*)

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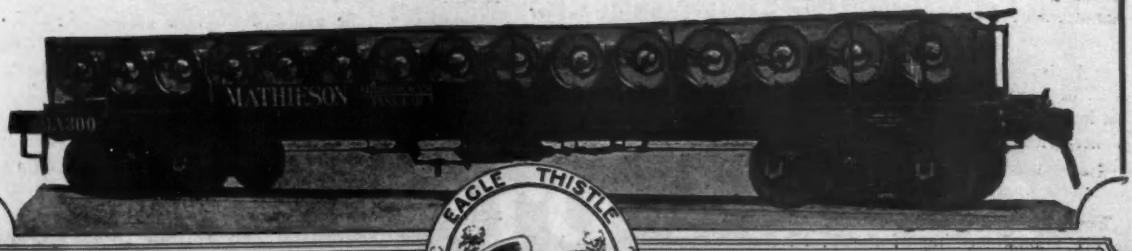

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Ontario Paper Trade Shows Great Improvement

Business Improves in Cities and Smaller Towns and Jobbers Anticipate an Active Spring Turnover—Several Price Adjustments Are Reported in Various Grades of Papers—Pulp Market Active and Mills Generally Well Sold—Lyons Defends Policy

Toronto, Ontario, March 1, 1926.—Business in the paper line shows a noticeable improvement from week to week, and is rapidly rounding into better shape. Mills are busy. In several of the smaller towns and cities trade is particularly good, and jobbers are looking forward to an active spring turnover. There have been several price adjustments in flat papers. All book papers have gone up ½ quarter of a cent as well as No. 1 sulphite bonds, while No. 2 sulphite bonds have jumped three quarters of a cent. Rag papers have also undergone a revision in quotations of a quarter of a cent upwards. The higher prices paid for pulp and other supplies are reasons given by the mills for the augmented figures.

The pulp market is active and all the mills are well sold up. In other lines of the paper business, there is a better feeling. Hauling operations in pulp wood are now going on apace in order to get the wood out to the shipping points while the snow lasts. In the Algoma district, there is a lot of wood being shipped daily by rail over the Algoma Central. Operators as a whole have had a very good season and, with continued snow for the next few days, they feel that there will be plenty of water in the stream to float the logs to the mills. The weather conditions so far have been equal to other successful seasons.

Defense of Pulp Wood Policy

The Hon. James Lyons, Minister of Lands and Forests for Ontario, in the provincial legislature recently, defended the action of the government in granting additional leases to several pulp and paper companies in the northern and northwestern parts of the province. He said that in the tenders for pulp limits in the Nipigon region, the Spruce Falls Company had been successful. Two other firms had tendered but, in one case, no deposit accompanied the bid, while another firm had failed to comply with the conditions called for. Asked as to how long Ontario's pulpwood resources would continue, if such large areas, approximating nine thousand square miles, were let to the Spruce Falls Company, of Kapuskasing, Mr. Lyons pointed out that the Ontario government, under the terms of the leases, allows a company to cut only so much pulp wood annually; that the license of a company has to be renewed from year to year; and that the Crown can prevent it from cutting any particular section, which action is considered in the best interest of the province. The Hon. G. Howard Ferguson, Premier of Ontario, said that the government would insist on companies carrying out the brush burning program. The idea was to plan so that at the end of each forty years, each territory set aside would have grown timber on it again. He added that the province had at present the best arrangement for the protection and conservation of the timber that it ever had.

Gives Talk to Commercial Stationers

C. R. French, of the Howard Smith Paper Mills, Toronto, gave an interesting and instructive address before the Commercial Stationers' Association recently on the manufacture of paper, tracing the growth and development of the industry in Canada from its inception up to the present period.

F. N. Burt Co. Annual

The annual meeting of the F. N. Burt Company, which was held in Toronto on February 25, adopted the financial statement and elected the old board of directors, S. J. Moore, of Toronto, is president of the company, which is concentrating its operations on the two principal plants. The capacity of the main plant will be doubled. The property to round out the additions has already been purchased and there is sufficient cash in the treasury for the building. It was remarked at the meeting that business conditions in the United States are excellent and are also better in Canada than they have been for some time.

Bear River Plant Sold

Word has been received in Toronto to the effect that the Chicago Title and Trust Company has bought the plant of the Bear River Pulp Company at Bear River, N. S., which has been idle for some time. The purchase price is reported to be $525,000, and the sale took place at an auction under the direction of Sheriff Edwards of Annapolis County. The sale was made under foreclosure and granted in an action, which the Toronto General Trust Corporation brought on behalf of the first mortgage bondholders of the Bear River Company, Major Kinney, of Toronto, negotiated the sale.

Notes and Jottings of the Industry

H. J. Hugill, who for several years was in charge of woods operations and the rossing department of the Oxford Paper Company, Rumford Maine, in connection with their activities at Murray, N. S., and Montmorency Falls, Que., is spending some time in Toronto.

Charles Allen, sales manager of the United Paper Mills, who has returned from a week's trip through the principal cities of Western Ontario, in company with W. W. Howell, of London, Western Ontario representative of the company, reports that business in the paper line shows a noticeable improvement at many points.

G. D. Falkenburg, of Price Bros. & Co., Quebec City, spent a few days in Toronto last week calling upon members of the trade.

Paper sales, Ltd., Toronto, have taken over the Ontario agency for the Western Quebec Paper Mills, St. Andrews East, Que., who manufacture onion skin, white and colored tissues, wax paper, etc.

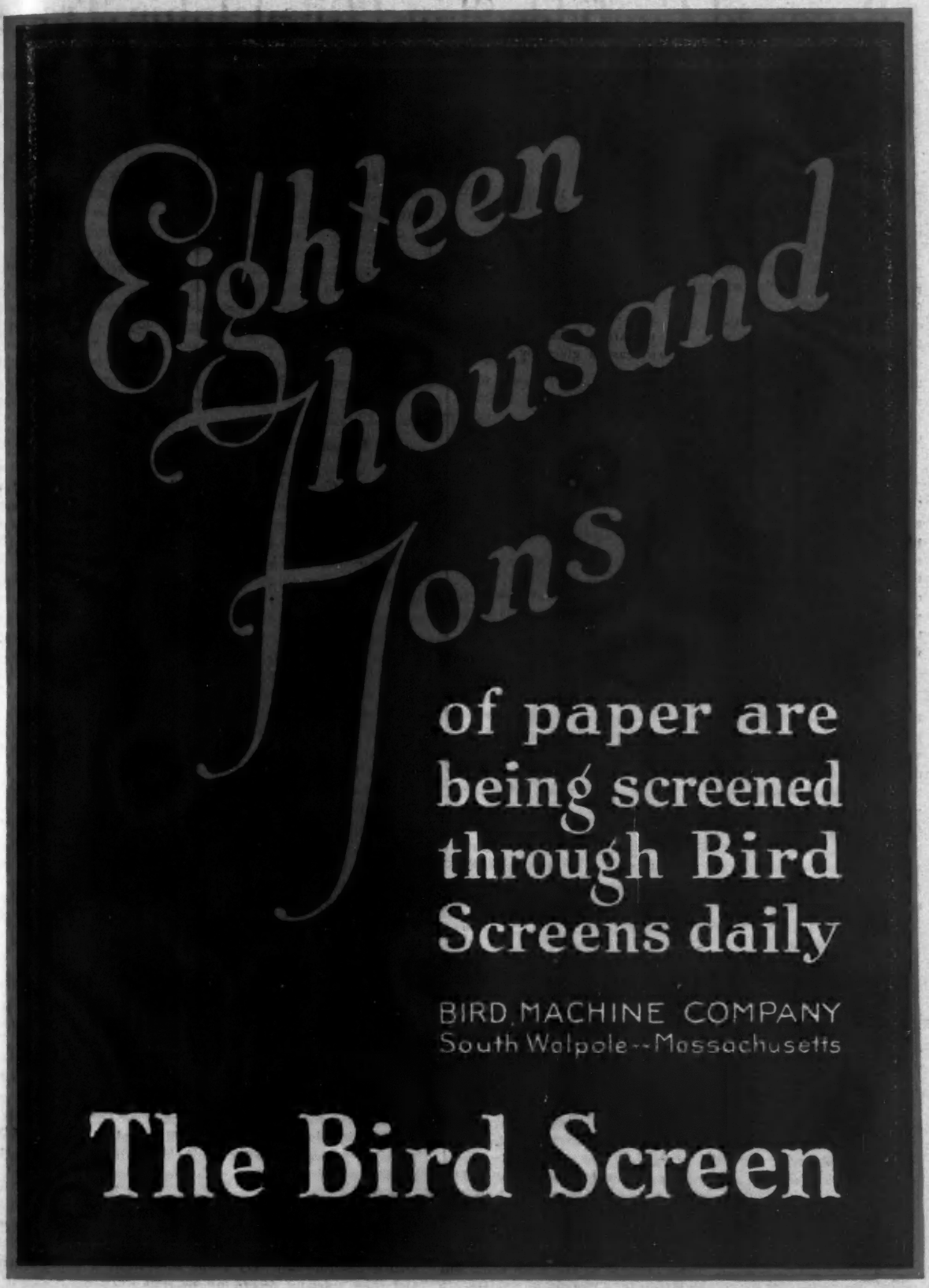
Some forty tons of waste paper, accumulating in the vaults and cellars of the legislative buildings for Ontario ever since Confederation, which took place in Canada in 1867, were cleaned out recently and sold to a Toronto firm. The consignment consisted of out of date records and it took fifteen trucks to convey away the mass of material.

Canadian Cartons, Ltd., Toronto, was recently granted a provincial charter to carry on the business of manufacturing and dealing in paper bags, paper boxes, envelopes and similar materials.

Tenders will be called during the coming week for the construction of the new fifty ton strawboard mill, which will be erected at Trenton, Ont., by the Hinde and Dauch Paper Company, of Canada, of which O. H. Moore, of Toronto, is the general manager.

Don Clark, of Port Arthur, Ont., has been awarded a contract by the Nipigon Corporation, of Nipigon, Ont., to supply twenty thousand cords of pulpwood, the contract to be completed in May next.

Honoring the Ontario lady softball champions, the Toronto Ladies' Softball League and the Hinde and Dauch Ladies Club entertained the champions to a banquet and presentation dance, at Sunnyside Pavilion on February 24. The Hinde and Dauch Company are very proud of their lady softball champions, and their splendid record of victories.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Renewed Confidence in Philadelphia Trade

All Standard Grades Move in Greater Volume and Attitude of Market Becomes More Encouraging—Demand for Various Grades of Fine Papers Fairly Well Maintained—Coarse Paper Industry Experiences Steadier Trend—Paper Stock Only Drifting Along

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 1, 1926.—After a brief rest, the paper market has again taken on a more encouraging attitude, and all the standard grades have been moving in greater volume. It may be that the settlement of the coal strike has given a new spirit of optimism to the general industrial world, and it is preparing to assume broader operations. This renewed confidence is reflected in the steadier course of the paper industry as it pertains to Philadelphia and its distributive field. While there was some apprehension over the sudden cessation of the more active business of early February, this has entirely disappeared, and all the dealers are again sharing in the betterment which the industrial life of the community is enjoying. Mills are finding more responsiveness to their appeals for orders and with prices turning to more steady levels, the local paper markets are more promising than they have been for some time.

Fine Papers in Fair Demand

While the local trade is not as active as earlier in the year, there nevertheless is a fairly well maintained demand for all grades of standard products in printing papers, publishers supplies, and for some of the writings used by the manufacturing stationers. After a short narrow market for specialties within the past week or so the distribution of fine papers has again expanded to a more generalized buying on the part of the consumer. State distribution of fine paper shows a broadening tendency, and although still far from normal, has been more gratifying than for many months.

Steadier Coarse Paper Markets

The most gratifying factor in the local industry is the steadier trend in the coarse paper markets. With the Association endeavoring to correct disturbing trade customs, the co-operation of the mills, and the publicity given to impending evils that might be detrimental to the paper markets, every caution has been taken to rectify conditions so that the coarse paper dealers are now more tranquil over the outlook. The dumping at wholesale of Krafts and some of the sulphate manilas, which was disturbing conditions a few weeks ago, has ceased for the time being, and with its disappearance prices are again at steadier levels and fair profit margins. Mills report better buying on the part of the dealers and resumption of business in preparation for the coming Spring activities in the mercantile trades.

Stagnation In Paper Stock

The paper market is drifting along with but little movement in any of the grades. The present stagnation is due to the glutting of the market with accumulated stocks. For years there has been a shortage of paper grades and this is the first time that a report of overstocking in the warehouses has been reported within three years. The demand has always been in excess of accumulations. Though the mills are not at all concerned with purchases of paper stock at this time, prices show no signs of slumping and are holding to the levels of the past month, when there was a slight rise in values. Rags have been subjected to flurries of demand and spasmodic buying from the mills. Like the paper stocks they have not undergone any material changes in quotations and hold to the prices of the early year. The wholesale dealers in raw materials report the market as monotonous, due to lack of interest on the part of the mills.

Philadelphia Paper Dealers At Convention

With the migration of almost the entire Philadelphia representation of paper dealers to the Metropolis last week, there were very few left at home to take care of the trade in the city, turned over entirely to the workers who did not attend the National Convention. Because of this wholesale desertion of the local trade the closing February meeting of the Fine Paper Division of the Philadelphia Paper Trade Association was held over until this Thursday. At this gathering there will be reviewed the activities of the National Convention for the benefit of those who did not attend. Another important feature to be discussed at the meeting is that of the plans for the coming paper exhibit to be held at the Sesqui-Centennial. From now on this Sesqui-Exhibit will be the outstanding interest of the trade and it is hoped to make it a worthy display of the industry from its sources and preparation of the raw materials to the consumption of paper in the various industrial fields.

Insurance Suit of Keystone Mills Postponed

Owing to the illness of the presiding jurist, Judge Johnson of the Court of Common Pleas in Media, Pa., the suit in which the various insurance companies and the Keystone Paper Mills are involved has been postponed until the April term of Court. The case came up for trial last week and although it was expected that it would come to a hearing before the week closed no action was taken owing to the inability of Judge Johnson to attend Court. The case is of interest to the trade because of its importance in the matter of rights of the paper manufacturer to secure full compensation for insurance on property damaged or destroyed by fire. The Keystone Mills of Upper Darby were owned by the claimants, W. Allan Lindsay and his associates in the firm of Lindsay Brothers, paper distributors of this city. They are David Lindsay, Sr., and his sons, David Lindsay, Jr., and Horace Lindsay. The Keystone Mills were partly destroyed by fire, and several of the remaining buildings badly damaged, as was the mechanical equipment devoted to the manufacture of wrappings papers and greaseproof and wax products. The fire occurred about a year and a half ago. Since then the mills have been sold to the Philadelphia Rapid Transit Company for the 69th street terminal. There are 18 insurance companies involved in the disputed amount of insurance due to the paper manufacturers, totaling $200,000. With the passing of the Keystone Mills the trade lost one of its most prominent local paper landmarks, the mills having been in continuous operation for more than a century.

A. S. Datz & Son To Move Into New Home

With the return of John Datz from a trip through the Florida Resorts where he has been vacationing for the past five weeks, A. S. Datz and Son Company, of which he is head, will remove to its newly constructed home at 16-18 S. Marshall street. With the removal of the firm to the new quarters constructed on the site of its old location occupied for many years, there will be available one of the most modern of paper warehouses and executive offices for the distribution of fine paper and box makers supplies in which the company deals. Removal of the executive offices will be made this week and in the latter part of March the firm will be entirely settled in the new home.

Richie Howarth Co. Opens New Home

The doors of the newly constructed home of the Richie Howarth Paper Company, at 1217-19 Cherry street, were opened for business today. The firm organized several weeks ago, will, with the

(*Continued on page 74*)

Established 1886
OUR 40TH YEAR

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The buyer in need of expeditious service will find our facilities equal to any emergency, especially during the winter season with its numerous contingencies due to weather conditions.

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Pulp and Paper Legislation in Quebec

By C. L. Sibley

Important developments have taken place in Quebec Province during the past year as regards legislation affecting the pulp and paper industry. In the first place, the Quebec government has adopted a new policy designed to encourage the manufacturing of news print within the Province. This policy was divulged by a special clause included in the conditions for leasing large timber limits in the Ottawa River and Lake St. John districts, providing for the establishment of news print mills of stated minimum capacity for the manufacture of the pulpwood cut from the limits.

The insertion of this clause brings into prominence a situation not clearly understood by many. No Provincial government has a right to impose an embargo on the export of any product, authority in regard to all questions of import and export to or from the Dominion resting with the federal authorities. But each Province (with the exception of the three Prairie Provinces) owns its own natural resources. In Quebec Province most of the timber limits are government property. The Quebec government cannot actually prohibit export of pulpwood from these lands by the establishment of an embargo, but it can accomplish the same end by inserting a clause in every permit granted for cutting timber on these lands by which the lessee agrees to manufacture such pulpwood within the province. Under this policy, exports of raw pulpwood from Crown lands have been impossible for some years.

To Carry Plan a Step Further

It would now appear to be the settled policy of the Quebec government to carry this plan one step further. Hitherto the government has been content to have the pulpwood manufactured into pulp and exported in that form. Now it is stipulating that in all new leases for cutting timber on Crown lands there shall be an agreement that the pulpwood shall actually be manufactured into news print before being exported.

This raises a new question, namely, will the government follow this up by stipulating for the manufacture of other finished products? For instance, not all the timber cut in future can be utilized for the manufacture of news print. The manufacture of rayon, or artificial silk, from wood pulp is assuming stupendous proportions, and in the supply of raw material for this product Canada at present holds an outstanding position. It was stated at the recent annual meeting of the Canadian Pulp and Paper Association that 50 per cent of the chemical pulp used for the world's production of rayon comes from Canada.

A Puzzling Question

It will be seen that in the manufacture of pulp in its various forms Canada has built up a most important trade. If permits are sought for timber-cutting for purposes other than the manufacture of news print as a final product, will the Provincial government decline to grant such permits, or will it insist that the final product be named and manufactured within the Province? The question thus opened up is a most interesting one, and may well prove a most difficult one to solve. Wood pulp is now used in the manufacture of such a wide variety of products that it would be almost impossible to say where raw material ends and finished product begins. For instance, mechanical and chemical pulps are manufactured products, but they are raw material for the manufacture of paper and artificial silk—to name only two. Paper is a manufactured product, but it is the raw material for the manufacture of newspaper and books. Silk is a manufactured product, but it is the raw material for the manufacture of stockings and many other garments.

It is generally recognized that the Provincial government has embarked on a difficult course in stipulating for the manufacture of one specified product, namely news print, when so many other products are manufactured from pulp, and that the future in regard to this policy will be beset by many thorny problems. However, the government appears to have decided to meet these difficulties one at a time as they arise, and if it is found that the stipulation of news print alone as a final product interferes with the industrial development of the Province instead of expanding it, there is no doubt that modifications will be adopted to suit the circumstances.

Pulpwood on Freehold Lands

During the past year the demand for an embargo on the export of pulpwood from freehold lands has continued, and from this discussion two facts emerge:

1. The reluctance of the government authorities, both federal and provincial, to attempt any such embargo.

2. The absence of any settled pulpwood policy for Canada.

In regard to the first point, the salient feature is that any interference with the free marketing of pulpwood from privately-owned lands would be an interference with the property rights of individuals, and particularly with the private rights of farmers. Many thousands of farmers find profitable employment in the winter in cutting pulpwood on their own lands and selling this to the highest bidder, whether Canadian or American. In many cases the American offers the highest price, and no government would dare to prohibit sale to outside buyers, as the farmers would be certain to rise in revolt against any such legislation.

As regards the second point, there is widespread recognition of the need for a settled pulpwood policy to prevent depletion of the forests, but no such policy has yet been forthcoming.

Cropping the Forests

R. O. Sweezey, B.Sc., who is well known in the industry, is of opinion that the real remedy lies in changing the method of operation and "cropping" our forests. He says that in the Province of Quebec, with 280,000,000 cords of standing pulpwood, we are at present cutting some 4,000,000 cords a year. Within a few months the cut will be increased to nearly 5,000,000 cords.

"It is safe to say," he remarks, "that if the whole of Quebec's forests were in a growing condition the annual increment might be 2 per cent as an overall average. But probably more than 50 per cent of the forests of the Province are mature and therefore are not making any annual gain, yet our annual cut grows relentlessly. We are cutting more than the annual increment and are about to do worse."

He proceeds to argue for careful study and the application of scientific methods in order to "crop" our forests, adding, "We cannot long delay our change in forest policy. Already we have mortgaged our children and grandchildren with increasing municipal, provincial and federal debts; are we going to hand on to them barren watersheds with which to pay for our damn foolishness?"

Demand for Government Restrictions

On the other hand, there are those who are still looking for government restrictions on export as the principal desideratum. Thus the Canadian Pulp and Paper Association stands by its resolution of last year calling for an export tax on pulpwood, and J. E. A. Dubuc, Liberal member for Chicontimi, and prominent in the industry in the Saguenay district, has announced that he intends to introduce a resolution in Parliament in favor of an export tax of $10 a cord on pulpwood.

Against any such proposal, and against anything in the nature of an embargo, strong opposition is offered by the Canadian Pulpwood Association, a representative and influential body. This Association thinks that a fair-minded "Pulpwood Policy for Canada" was outlined by the Hon. John Hall Kelly, in a recent speech in the Quebec Legislature in which he said:

"I am told that our pulp and paper mills could easily consume

100%

—and now One State uses

The Voith Inlet

exclusively-on its Fourdriniers

Voith High Pressure Stock Inlets are depended upon to produce better paper at a lower cost in a well developed paper making section of the United States—Minnesota—with its notable prosperity among paper manufacturers that is attributed to their enterprise and expansion.

The Minnesota manufacturer fully realizes that up-to-date machinery is essential for lowering costs and improving his product. Furthermore, he realizes that he pays for new equipment indirectly though he does not install it because higher operating cost is always the result of old and inefficient machinery.

The first step in deciding how to lower your production costs—improve your product and increase production—is to write for your copy of the patented Voith Inlet Booklet. This booklet describes the Inlet in detail. Write that letter today.

Inlet Users in Minnesota

Name	Size
Northwest Paper Company	96"
Northwest Paper Company	120"
Northwest Paper Company	120"
Northwest Paper Company	124"
Itasca Paper Company....	80"
Itasca Paper Company....	120"
Hennepin Paper Company.	120"
Watab Pulp & Paper Co.	152"
Watab Pulp & Paper Co.	152"
Minn. & Ontario Paper Co.	154"
Minn. & Ontario Paper Co.	154"
Minn. & Ontario Paper Co.	182"
Minn. & Ontario Paper Co.	182"

VALLEY IRON WORKS CO.

APPLETON, WISCONSIN

New York Office: 350 Madison Avenue

a considerable part of the wood that is now being exported. If this is so, could not our pulp and paper manufacturers themselves bring about what they no doubt desire by purchasing in the open and free market a great part of the wood that is now going to the United States?"

Pulpwood Men Sum Up Situation

Meanwhile the Association sums up the situation as follows:

"Here are a few facts that the public has learned in the last two years:

"1. 85 per cent of Canada's pulp and paper production enters the United States free of duty.

"2. 85 per cent of Canada's pulpwood is already under embargo and cannot be exported.

"(Isn't this a pretty fair bargain for Canada?)

"3. The remaining 15 per cent of the pulpwood in Canada is the private property of citizens and is that portion which would alone be affected by the embargo or export tax that is now proposed.

"4. Of the pulpwood produced in Canada in 1908 but 36 per cent was manufactured here—the balance 64 per cent being exported.

"5. By 1924, however, 72 per cent was being manufactured in Canada and only 28 per cent exported.

"6. In a word, natural economic conditions are bringing about the very thing every one so earnestly desires, viz.: insofar as practicable the manufacture of our wood in Canada.

"The more the public comes to a knowledge and understanding of the facts in regard to the business of paper, pulp, and pulpwood, the less inclined it is to favor restrictive legislation."

Export of Water Power

Another important development during the year which has a bearing on the industry is the uncompromising stand taken by the Quebec government against any further exportation of hydro-electric energy. This matter was brought to a head by the plan put forward by a syndicate headed by G. A. Robert, formerly president of the Montreal Tramways Company, for the development of the Carillon water-falls on the Ottawa River just above Montreal, and the exportation of 200,000 h.p. to the United States. Premier Tarchereau announced that he would fight such exportation tooth and nail, although he would co-operate in the development of the power for domestic use. As a result the proposal for the export of power has been dropped, and the development is likely to proceed for the local use of the power. The discussion, however, has resulted in the announcement that the Quebec government will bring in legislation to prevent any future export of power from any falls yet to be devoleped in the Province.

An instance of the application of the new policy is seen in the lease of the power rights of 100,000 h.p. at Des Chats Falls, on the Ottawa River. The lease provides that "no power or electrical energy shall be exported outside of Canada, either directly or indirectly, and, in case of breach or infraction of this clause, the Government reserves the right to cancel and annul the lease, after three months' notice . . . and to take back possession of the property leased." The conditions will permit of the sale of power for consumption in Ontario, but with such reservations as will amply protect the rights of Quebec. All this, as has been said, is a part of a general plan and a settled policy.

Big Increase in Hydro-Electric Installation

In this connection it may be pointed out that the total hydro-electric installation in Canada has increased by 719,000 h.p. during the year, and now stands at 4,290,000 h.p. This is the largest addition in any single year on record. Quebec Province made the largest addition of the year with 438,300 h.p., and Ontario came second with new installations of 200,000 h.p. British Columbia added 58,984 h.p., and Manitoba 21,900 h.p.

Development of Pulp and Paper Industry

As regards the development of the pulp and paper industry, astonishing progress has been made during the past year, especially in Quebec. Of the 115 pulp and paper mills in Canada, 49 are in the Province of Quebec, and Quebec is the leading producer of both wood pulp and paper in the Dominion.

The greatest progress, of course, has been in regard to news print. Contrary to fears expressed early in the year, the increased production of news print coming on the market did not have the effect of creating an oversupply. The marked prosperity in the United States had the effect of increasing the demand for news print, and as a consequence most of the mills have been producing at capacity. Production of news print for the year, as compared with the previous year, was as follows:

Year 1925, tons	1,522,217
Year 1924, tons	1,352,994
Increase	169,223

How Exports Increased

Despite unsatisfactory conditions which still exist in some branches of the pulp and paper industry, the industry as a whole showed substantial progress, and in all the principal lines there were increases in the exports, as is shown in the following table, supplied by the Dominion Bureau of Statistics, and comparing exports for the year 1925 with those of the previous year:

	1925	1924
Paper:		
News print	$ 98,945,337	$ 90,990,711
Wrapping	2,777,338	3,222,520
Paper Board	3,170,859	3,386,925
All others	1,730,512	1,648,341
Total paper	$106,624,046	$ 99,248,497
Pulp:		
Mechanical	$ 10,573,273	$ 7,916,029
Sulphite (bleached)	14,049,500	12,383,645
Sulphite (unbleached)	14,150,271	11,611,367
Sulphate	9,158,861	8,331,931
Total pulp	$ 47,931,905	$ 40,242,972
Total pulp and paper	$154,555,951	$139,491,469

It is notable that December was the seventh month in 1925, and the fourth in succession, in which the production of news print in Canada exceeded that of the United States. Production for the month amounted to 136,983 tons, as against 136,681 in the United States.

While the bulk of Canadian news print is exported to the United States, small quantities are also exported to a number of other countries, notably to Great Britain, South America, New Zealand, Australia, and South Africa. Exports to these countries vary from around 10,000 tons to 25,000 tons.

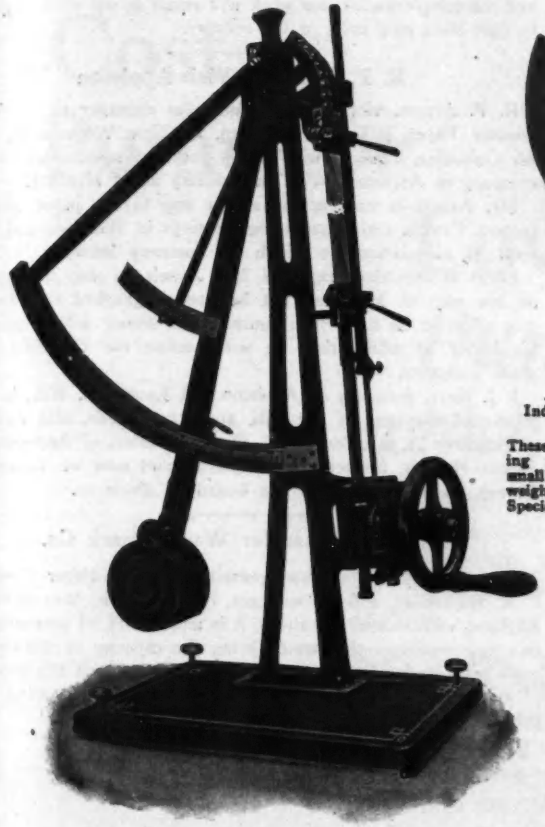
Increase in Exports of Pulpwood

The exports of pulpwood for the year amounted to 1,423,502 cords, valued at $14,168,935, as compared with exports of 1,330,250 cords, valued at $13,536,058 in 1924. While this shows an increase, the proportion probably represents a decline, when compared with the total cut.

A record of the production of pulpwood, that is, the cutting in Canada, for the past 16 or 17 years, shows that it has increased 250 per cent. By far the greater proportion of this increase is due to increased consumption in Canada. At one time the export of pulpwood represented about three times the domestic consumption, but at the present time the figures are reversed, and this proportion is growing steadily. A statement by the Dominion Bureau of Statistics in regard to the relation between the export and domestic consumption of pulpwood is as follows:

"In 1908 almost two-thirds of Canada's cut of pulpwood was exported to the United States. By 1913 this proportion had been reduced to less than half the total and by 1922 only a little more than a quarter of the cut was so exported. There was an increase in this proportion in 1923 but this was followed by a decrease to 28.6 per cent in 1924. During this period, when the actual quantity of pulpwood exported has remained fairly constant, the domestic consumption has increased until it is now almost seven times as great as in 1908 and absorbs 71.4 per cent of the total cut."

Poller Paper Instruments Insure Accuracy



PAPER TESTER No. 400

Indicates accurately tensile strength in pounds and percentage and stretch in inches and percentage—all in one operation. Temperature makes no difference. It is the "Supreme Court" of all testing machines. No springs to get out of order. No glycerine or rubber discs to replace. All numerals are in English units and not in Continental Metric system.

PAPER SCALE

Indicates ream weight 24x36—480 and 500

These scales are furnished for weighing a full size sheet, 24x36, or a small piece. Both will indicate ream weight by direct reading. No springs. Special scale for Tissue Papers.

POCKET SCALE

For coarse or fine papers. By weighing a piece 2½x3¾ the standard ream weight is accurately shown. Very accurate and reliable. Weighs less than one pound and can be carried without inconvenience.

Folding Endurance Tester

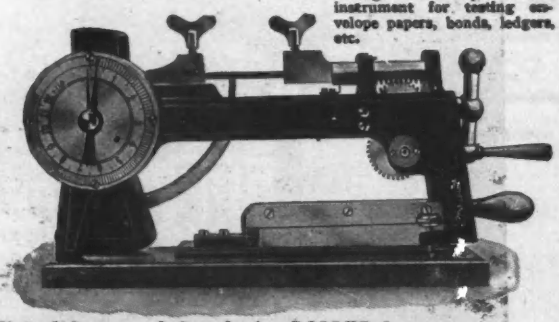
Indicates strength of paper by automatically folding a sample until it is worn through. A very valuable instrument for testing envelope papers, bonds, ledgers, etc.

AUTOMATIC MICROMETER

Measures thickness of board and paper accurately. Best instrument on the market for this purpose.

PAPER TESTER No. 399

Indicates stretch and breaking or tensile strength of paper. Operated by means of gears and screws. No springs to weaken and influence results. This machine is portable, weighing less than five pounds.



Sole Agents for the United States and Canada for POLLER Instruments

THE UNION SELLING COMPANY

PAPER AND TWINE

210 Walnut Street, Cincinnati, Ohio

Jessup & Moore Paper Co. Improves Plants

The Jessup & Moore Paper Company is enlarging and making many improvements at its Augustine Mills located in the city of Wilmington, Del., on the banks of the historic Brandywine River. This site from a paper manufacturing standpoint is also historic for here stood the first mill in America which ran a Fourdrinier wire. The best known product of this mill is its English Finish which has long been the standard for this grade. The other papers are no less distinctive in their class.

Because of the demand for these papers, it has been found necessary to add a new and larger machine and the work is already well advanced. The new equipment will add materially to the output of the mill. The paper machine will be built by the Pusey & Jones Company and will embody all the latest improvements, being especially designed to produce the finest quality of book paper. The wire will be one hundred and sixty-six inches wide by seventy feet long. Bird screens, Voith slices, large smoothing presses, intermediate breaker calenders, automatic reels and other recent improvements and inventions have been incorporated in the specifications.

To insure uniformity of speed and smoothness of operation, the machine will be driven by a Westinghouse electric drive. At the same time as this installation is being made, the balance of the mill will be electrified throughout. To take care of the increased product, additional calenders, cutters, etc., are being provided in the immediate future.

From the above it is apparent that neither pains nor money have been spared to accomplish the end desired by the purchasers and guaranteed by the builders, to erect the most up to date machine to produce the finest grade of book paper.

In addition to Augustine Mills, The Jessup & Moore Paper Company operate two other paper mills—the Rockland Mills at Rockland, Del., and the Kenmore Mills at Providence, Md. To provide raw stock for the manufacture of paper at the three paper mills, the company also operates two completely equipped pulp mills—Delaware Mills at Wilmington, Del., and Radnor Mills at Elkton, Md.

The company also at this time is electrifying the Delaware Mills and the completion of this work will result in one of the most up to date soda pulp mills in the country.

R. F. Arnett to Visit Appleton

R. F. Arnett, vice-president and sales manager of the Westminster Paper Mills, Incorporated, of New Westminster, British Columbia, Canada, will be the guest of stockholders of the company in Appleton, Wis., and vicinity about March 1.

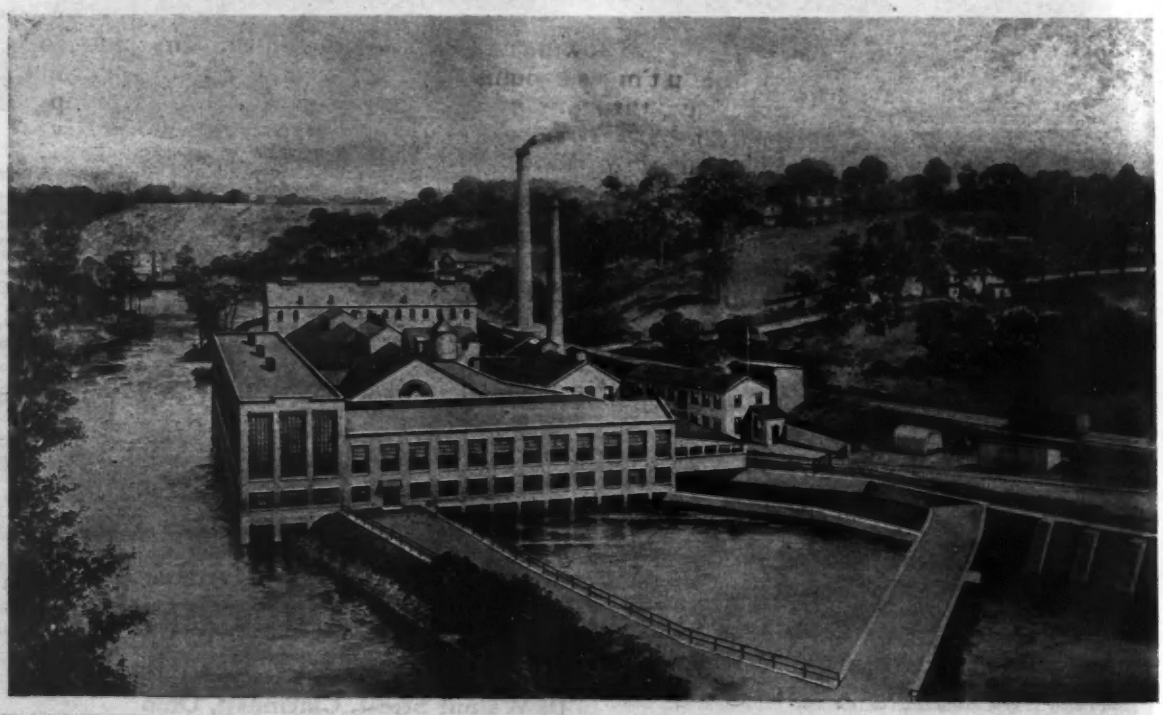
Mr. Arnett is making his spring trip to the paper trade in eastern Canada and is attending meetings in Winnipeg and Montreal of associations to which his company belongs.

Local stockholders expected Mr. Arnett to stop in Appleton on his way to Montreal, but he has telegraphed that he will stop off here on his return journey. A dinner will be given in his honor at which time he will outline the Canadian paper trade prospects.

J. J. Herb, formerly of Appleton and Kaukauna, Wis., is president and manager of the mill, and Ray Onkels, also formerly of Appleton is superintendent. O. P. Schlafer, of Appleton, and James Hinton, formerly of Appleton and now of Vancouver, British Columbia, are on the board of directors.

More Machines for Wayagamack Co.

The president of the Wayagamack Pulp and Paper Company, C. R. Whitehead, and the manager, Frank Ritchie, have sailed for England, with serious intentions, it is understood, of arranging for two new machines that would bring the capacity to 400 tons of news print daily. It was only in December last that this producer of sulphate pulp and wrapping paper started in producing news print.



AUGUSTINE MILLS OF THE JESSUP & MOORE PAPER CO.

Low Cost Pumps *or*

Low Cost *Pumping* *which satisfies you?*

If the initial cost of a pumping installation is your only consideration you will not be interested in Warren Pumps.

But if you choose your pumps on a "cost per year" basis, taking into consideration operating and maintenance cost as well as first cost, you can now be certain of the utmost pumping economy throughout your plant, for there is a Warren Centrifugal or Reciprocating Pump for practically every pulp and paper mill requirement.

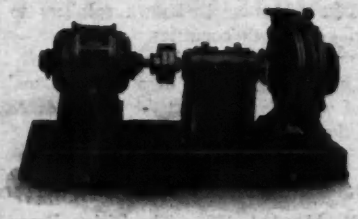
Warren engineers stand ready to cooperate with you to the fullest extent in planning pumping installations to fit your particular service conditions.

Does it mean anything to you to know that you can make sure of lowest pumping cost per year by specifying Warren Pumps?

Warren 8877

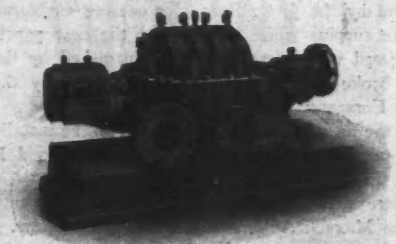
Steam Pump Company—Warren, Mass.

Boston Chicago New York Philadelphia St. Paul San Francisco



Warren Single Stage Single Suction Stuff Pump

Warren Centrifugal and Reciprocating Pumps are made in types and sizes to meet every pulp and paper mill need.



Warren Multistage Balanced Type Centrifugal Pumps for high pressure service

GENERAL VIEW OF THE PLANT AT EVERETT, WASH.

Improvements by Everett Pulp and Paper Co.

Many important extensions and improvements are being carried out at the plant of the Everett Pulp and Paper Company in Lowell, near Everett, Wash. Additions to the mill buildings will consist of a new Machine Room 50' x 324' two stories high, and a new Paper Finishing Room 68' x 178' also two stories, together with additions to the several Pulp Mill structures. All the new buildings will be of modern type and be built of concrete, steel and brick.

To Install 150 Inch Fourdrinier

A new one machine addition for the manufacture of book paper is now under construction at the plant and is to be placed in operation early in the spring of this year. The new Paper Machine is to have a wire 150 inches wide and is being built by the Pusey and Jones Company, Wilmington, Delaware. The machine will have Rotary Screens made by the Moore and White Company, Philadelphia, Pa.; Suction Pumps by the Nash Engineering Company, South Norwalk, Conn.; and a Winder made by the Moore & White Company.

Other Machinery Installations

The paper machine will be driven by a sectional electric drive to be furnished by the General Electric Company. This drive will be of the regulator type and have Falk gears connecting the motors to the paper machine rolls.

Triplex stock pumps will be furnished by the Beloit Iron Works, and three motor driven Jordan Engines by the E. D. Jones & Sons Company.

The crane and hoisting equipment for the new machine room will be supplied by F. M. Blethen, Hazleton, Pa.

The new machine and finishing rooms will be provided with heating and ventilating equipment as well as vapor absorptoin system by the J. O. Ross Engineering Corporation.

The surplus white water from the new paper machine will be reclaimed with a save-all to be furnished by the Dorr Company.

A broke beater will also be furnished by the E. D. Jones & Sons Company.

In the finishing department there will be installed a motor driven web calender to be furnished by the Norwood Engineering Company, Florence, Mass.

There will also be installed three rotary cutters with layboys by the Maxson Automatic Machinery Company.

A direct connected electrically driven roll grinder of the latest type will be furnished by the Farrel Foundry and Machine Company, Ansonia, Conn.

There will be four new steel welded digesters in the soda pulp department made by the American Welding Company, Carbondale, Pa., and a new high density pulp bleaching system to be installed by the Stebbins Engineering and Manufacturing Company, Watertown, N. Y.

The mill additions are being planned by and constructed under the supervision of George F. Hardy, 305-309 Broadway, New York.

International Forest Week Cooperation

An unique and significant conference was held in New York City on February 26 to arrange for cooperation between the United States and Canadian authorities in the joint observance of Forest Week, April 18-24, 1926. The conference was held at the invitation of R. S. Kellogg, secretary of the News Print Service Bureau, who is chairman of the executive committee of American Forest Week, and was participated in by D. R. Cameron, of the Forestry Branch at Ottawa; A. E. Cadman, assistant secretary of the Canadian Pulp and Paper Association; J. N. Stephenson, editor of the Pulp and Paper Magazine, all of whom are members of the Canadian Save-the-Forest Week Committee; and by Miller Hamilton, of the United States Forest Service; and Theodore N. Knappen, of the National Lumber Manufacturers Association, representing the American Forest Week Committee; and also Robert E. Hutchinson and Edward Hunter, of the Associated Advertising Clubs of the World, which has Canadian affiliations, as well as many members in the United States, and which is making a special effort to have programs devoted to forest protection subjects throughout the United States and Canada during Forest Week.

At the conference, the plans of both the United States and Canadian committees were discussed in detail, and many helpful ideas exchanged regarding the preparation and presentation of printed material, moving pictures and radio programs, together with an exchange of nationally-known speakers to address important gatherings in both countries.

The official proclamations for the week of April 18-24 in both countries will stress cooperation in a common undertaking, the basic purpose of which is to protect the forests of North America for the use of the people of the continent.

Disher Paper Corp. in New Quarters

Buffalo, N. Y., March 1, 1926.—The Disher Paper Corporation has removed both its business offices and warehouses to 67 Clinton Street, where it occupies larger and more convenient quarters. The removal was made necessary to enable the company to accommodate its rapidly expanding business.

INCH BY INCH

892"

In various wire widths now building

The widest machine 226"

The narrowest machine 28"

Ask Us

THE PUSEY AND JONES COMPANY

WILMINGTON, DELAWARE.

Trade Marks Department

CONDUCTED BY NATIONAL TRADE-MARK CO., WASHINGTON, D. C.

The following are trade-mark applications pertinent to the paper field pending in the United States Patent Office, which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade Mark Company, Barrister Bldg., Washington, D. C., trade-mark specialists. As an additional service feature to its readers, PAPER TRADE JOURNAL gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering.

TREASURY—No. 208,454. Carew Manufacturing Co., South Hadley Falls, Mass. For bond paper.

NARBRO—No. 219,758. The Orono Pulp & Paper Company, Bangor, Me. For wrapping paper.

ELASTIKRAFT—No. 223,186. The Paper Service Company, Arlington Heights, Ohio. For creped, sulphite and sulphate, bleached and unbleached wrapping paper.

MARK MOR-AN-DUM—No. 218,714. Mark Moran, Seattle, Washington. For continuous feed device for dispensing writing paper.

DAYBREAK—No. 219,743. Hoberg Paper and Fibre Company, Green Bay, Wis. For toilet paper.

EVERYWHERE LAVATORY TISCHINE—No. 219,744. Hoberg Paper and Fiber Company, Green Bay, Wis. For toilet paper.

IONIC—No. 223,524. Keuffel & Esser Company, Hoboken, N. J. For tracing paper.

ABACUS—No. 223,525. Keuffel & Esser Company, Hoboken, N. J. For tracing paper.

DORIC—No. 223,526. Keuffel & Esser Company, Hoboken, N. J. For tracing paper.

HAVANA—No. 224,603. Fort Howard Paper Company, Green Bay, Wis. For paper napkins, toilet paper, and paper towels.

PHOTOLITHOTONE—No. 221,749. William T. Manning, Waterbury, Conn. For stationery forms comprising commercial letterheads, mailing envelopes, invoices, statements, credit memorandums, order forms, checks and drafts.

ARROWHEAD—No. 222,134. The Northwest Paper Company Cloquet, Minn. For envelope papers.

JANE WANDL—No. 224,168. Woodward & Lothrop, Washington, D. C. For writing paper and envelopes, fountain pens, engagement books, etc.

OUR INVESTOR'S CLUB—No. 222,316. Thomas R. Ferguson, Chicago. For contract forms.

GIRL SCOUTS—No. 206,964. Girl Scouts, New York City. For loose-leaf binders and sheets therefor, tablets, papers, envelopes, pens, pencils.

JELCO—No. 225,230. J. E. Linde Paper Company, New York City. For toilet paper.

Safety Contest Awards Made

In the annual competition of Accident Prevention in the pulp and paper mills of Ontario for the shield and flag, in Class "A," the Spruce Falls Company, Kapuskasing, Ont., won first place with a record of 17 non-fatal accidents, involving 315 days lost time equal to 1.13 days lost time per full time worker or .376 days lost time per 1,000 hours exposure to hazard. The runner-up was the Spanish River Pulp and Paper Mills, Sault Ste Marie, with 64 non-fatal accidents involving 847.5 days lost time equal to 1.37 days lost time per full time worker or .457 days lost time per 1,000 hours exposure to hazard.

In Class B, the Don Valley Paper Company, Toronto, with no lost time accidents of any kind captured first place, the record of this mill being faultless. This company has won the shield and bag three times running, with a perfect record. The runner-up in Class "B" was Miller Bros. Company, Glen Miller, with one non-fatal accident involving 22 days lost time equal to .46 days lost time per full time record or .156 days lost time per 1,000 hours exposure to hazard.

"An interesting feature," says A. P. Costigane, secretary-engineer of the Ontario Pulp and Paper Makers' Safety Association, "in the 1925 Class 'A' competition, is that a new record has been established. In 1924 the winning mill had a record of 1.28 days lost time per full time worker. The 1925 leaders improved on that with 1.13 days lost time per full time worker or, in other words, an improvement of 19.5 per cent."

Leaves Victory Bag Co.

A. Pareira, in a recent interview, stated that he had severed his connection with the Victory Bag and Paper Company, effective March 1, resigning as general manager, and that he has sold out his entire holdings. He will have no connection whatsoever with the Victory Bag and Paper Company after that date.

His plans for the immediate future are indefinite, but undoubtedly a great portion of his time for the present will be devoted

A. PAREIRA

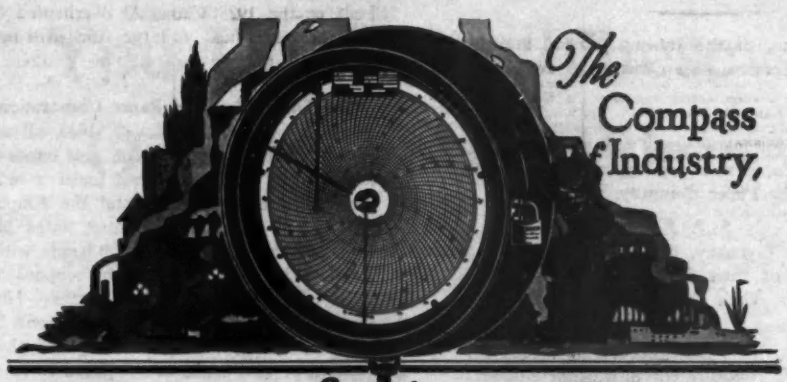
to the Reliance Paper Company, Inc., of Marinette, Wisconsin. This concern, in which he holds the majority interest, is at present manufacturing hand-made bags and paper specialties, and shows the progressive spirit of its main stockholder.

Sewall Timber Cruisers Busy

Harry W. Hussey, of the James W. Sewall cruising office, Old Town, Maine, with several other cruisers and surveyors, is making an extensive cruise of certain pulpwood lands in Newfoundland. B. C. Marsh, and Paul Gardner of the same office are also in Newfoundland on another large tract. They will be busy until the spring breakup, this time of year being a most favorable one to do cruising in that country on account of ease of moving men and supplies, and because excellent snow-shoeing is almost certain.

Kenneth M. Clark and Joseph D. Latno of the same office, with several surveyors, are also employed until the breakup on an extensive cruise in northern Nova Scotia.

Mr. Sewall has just returned from a trip into New Brunswick, New York and Massachusetts, and reports considerable activity in his line of work.

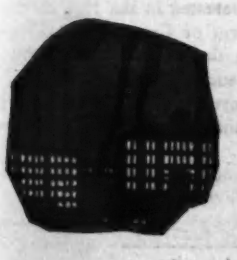


The Compass of Industry,

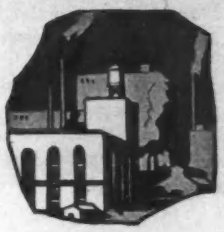
ARE YOU *Saving* MONEY *in* YOUR PLANT *Like these Concerns?*

WHERE temperature, pressure or humidity enter into your manufacturing operations—and they do in 99 cases out of 100—savings such as these are possible:

Foxboro Recording Thermometers installed on seven smoke houses enabled the Philadelphia plant of a nationally known meat packer to cut down weight shrinkage to the tune of $5000 a year.



A Foxboro Recording Psychrometer enables the night engineer and plant superintendent of a famous chewing gum company to maintain a constant relative humidity which prevents the sticks of gum sticking together. Previously the gum had to be reworked several times a month. The saving in labor alone is estimated in excess of $450 a month.



A New Jersey Chemical Company saved between 3 and 5 per cent of its fuel bill by installing a Recording Pressure Gauge on the fan engine in the power house.

Such savings as these are possible if you recognize one fundamental principle—*that the engineer or production manager can improve conditions in your plant only when he knows what they are.*

Foxboro instruments for indiating, recording and controlling temperature, pressure and humidity show exactly what conditions are every minute of the day and night. These scientifically accurate, dependable instruments enable you to increase production and to save men, money and materials.

What is your problem? Write or wire. Your case will be given individual attention.

THE FOXBORO CO., Inc.

Neponset Avenue, Foxboro, Mass., U. S. A.

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Cleveland Rochester Tulsa Atlanta
Los Angeles San Francisco Portland, Ore.

Peacock Brothers, Limited, 1605 Delorimier Ave., Montreal, Canada
Sole British Representatives: Walker-Crosweller & Co.
66 Dane's Inn House, Strand, London, W.C.2.

FOXBORO

REG. U. S. PAT. OFF.

INSTRUMENTS FOR INDICATING, RECORDING, CONTROLLING TEMPERATURE, PRESSURE AND HUMIDITY

New York Trade Jottings

B. Frank Heintzleman, of the Juneau, Alaska, branch of the United States Forest Service, was a visitor to New York early this week.

* * *

John F. Baker, who for many years was superintendent of the Ravenswood Paper Mills, is now day superintendent of the plant of the Hinde and Dauche Paper Company, at Gloucester, N. J.

* * *

The E. M. Sergeant Company, dealers in paper mill supplies, announce the removal of their offices to 501 Fifth Avenue, at 42nd street, New York. Their telephone number is Murray Hill, 7393.

* * *

John Gilmour and F. Jones, of the Anglo-Newfoundland Development Company, Ltd., of Grand Falls, N. F., visited several of their friends in the New York paper industry, early in the week.

* * *

Roderic Olzendam, in charge of industrial relations for the Spanish River Pulp and Paper Mills, Ltd., of Sault Ste. Marie, Ont., has been spending several days in New York in the interests of his organization.

* * *

The United States Envelope Company reports for the year ended December 31, 1925, net income of $794,449 after charges, taxes and depreciation, equivalent after preferred dividends to $29.30 a share. This compares with $456,428 or $10.08 a share in 1924.

* * *

Jerry Brookman, of the J. A. Brookman Company, Inc., announces the opening of new offices for his organization at 741 Cunard Building, 25 Broadway, New York, where they will handle all grades of paper making material, paper stock, woolen rags, waste paper, cotton and wool waste, foreign and domestic. The telephone number will be Bowling Green, 7077-7078.

* * *

G. W. Forrister, of the manufacturing department of the International Paper Company, gave an extremely interesting and informative talk on the treatment of pulp, at the March 1 luncheon of the New York section of the Salesmen's Association. Mr. Forrister's talk covered the various steps in the treatment of the various kinds of pulp between the blow-pit and the paper machine, and brought out many questions from the salesmen present.

* * *

Daniel M. Hicks, Inc., specialists in paper mill supplies, of 200 Fifth Avenue, New York, gave a splendid banquet to some fifty of their friends in the paper industry on the Wednesday of Convention Week, at the Hotel Pennsylvania. During the dinner the Cleft Club orchestra rendered many enjoyable vocal and instrumental selections. Following the banquet a high class vaudeville entertainment was presented which was greatly appreciated by all present. Each guest received a novel fountain pen souvenir. This event was the third annual banquet given by Daniel M. Hicks, Inc., and these affairs are deservedly gaining a great reputation.

* * *

The Stein-Brill Corporation, with offices at 25 Church street, New York, has recently been formed for the purpose of buying and selling complete plants and individual pieces of equipment in the following lines of industry: Chemical, Soap, Oil Mill, Oil Refineries, Sugar, Paper Mill, Rubber, Paint, Industrial Alcohol, Fertilizer, Packing House, Laundry, Textile, Dyeing, Contractors, and Allied Lines. The officers are Louis I. Brill, president, and Jerome D. Stein, secretary-treasurer, both engineers with years of practical experience. The company endeavors to establish itself on a high plane and to give the unusual service of guaranteed rebuilt equipment, thoroughly overhauled by their own competent staff of mechanics. A large stock will be on hand for immediate shipment.

* * *

The Union Bag and Paper Corporation has called for redemption and payment on May 1, 1926, all of the outstanding series A first mortgage six per cent. gold bonds dated as of May 1, 1922, due May 1, 1942, and issued under a mortgage or deed of trust between said corporation and the Empire Trust Company and LeRoy W. Baldwin, as trustee, dated May 1, 1922. Upon presentation and surrender of such bonds, with the coupon due November 1, 1926, and all subsequent coupons attached, at the principal office of the Empire Trust Company, 120 Broadway, New York, on or after May 1, 1926, the bonds will be redeemed at one hundred and five per cent. of the principal amount thereof, and the holders of said bonds are required to present and surrender them as aforesaid. Interest on said bonds ceases May 1, 1926. The holders of said bonds may at their option present them prior to said date with the coupon due May 1, 1926, and all subsequent coupons attached, at said office of the Empire Trust Company for redemption at one hundred and five per cent. of the principal amount thereof and accrued interest to the date of presentation. Registered bonds must be accompanied by duly executed assignments or transfer powers.

RESOURCES TAX IN QUEBEC

(*Continued from page 27*)

pected that the installation of the four machines will be completed by July, when the capacity of the mill will be 700 tons a day.

International Paper Co. in New Brunswick

According to the *Daily Gleaner*, of Fredericton, N. B., the International Paper Company is negotiating for New Brunswick Railway Company lands, amounting to 1,600,000 acres, at a price which will not be less than $15,000,000, and may be considerably more. The *Gleaner* says that if the deal goes through it means the International Paper Company will carry on a development in New Brunswick similar to what has been and is being done in Ontario and Quebec in connection with their policy of transferring their pulp and paper manufacturing activities from the United States to Canadian territory.

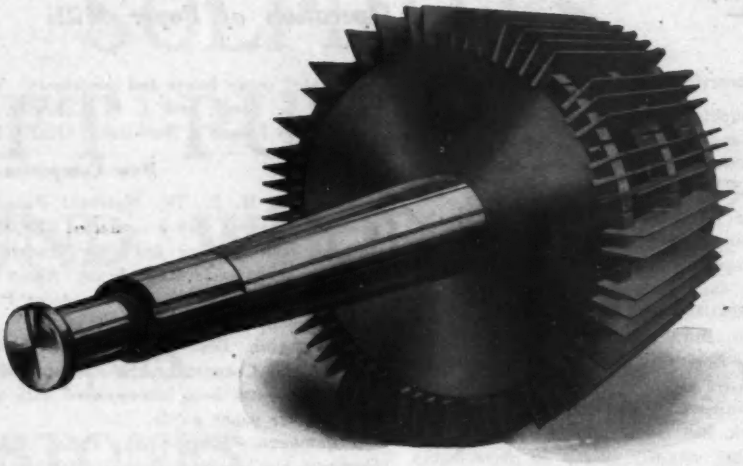
Meanwhile another hydro conference has been called for in Montreal, when the parties interested in the New Brunswick Government's plans for development of Grand Falls will get together again. These parties include the International Paper Company, and it is said that the completion of the purchase of the timber lands above referred to is dependent upon the making of satisfactory arrangements with the Provincial Government for the development of Grand Falls. If an agreement is reached the establishment of a big pulp and paper industry on the St. John river, somewhere between Fredericton and Grand Falls, is anticipated.

Simplification Committee to Meet

WASHINGTON, D. C., March 3, 1926.—Word has been received here that the Simplification Committee recently appointed by the American Paper and Pulp Association for the continuation of the paper simplification program, will hold a number of sessions, going over the ground that has already been covered before any meetings are held in this city in conjunction with the Simplification Division of the Department of Commerce.

It is probable, it is understood, that the committee will take two or three months to consider the matter following which it will communicate with the department as to further conference in conjunction with other factors interested in the program.

You Don't See These On The Scrap Pile



The Downingtown Bandless Beater Roll has been on the market for over 10 years and in that time its design has not been equalled by any other roll. Briefly, its features are as follows: No wedges, bolts, nuts, bands or fusible metal used to hold the bars. Bars are slotless, require no shims, are designed for maximum strength and machine finished. Damaged bars can be replaced in one tenth the average time without disturbing the other bars. Ordinary labor can fill the roll without special tools and without removing roll from the lighter. Least number of parts of any roll on the market.

A Few Users

Congoleum-Nairn Co., Asbestos, Md.
Ruberoid Company, Joliet, Ill.
Barrett Mfg. Company, Elizabeth, N. J.
Penn Fibreboard, York, Penna.
Hinde & Dauch Paper Co., Sandusky, Ohio.

Old beater rolls of the banded and bandless type made by other manufacturers, are continually being sent to us, to be rebuilt into our type of Bandless Roll. Why not send us one of your old rolls to rebuild?

DOWNINGTOWN MANUFACTURING COMPANY
Paper and Pulp Mill Machinery
EAST DOWNINGTOWN, PA., U.S.A.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Potsdam, N. Y.—The Raquette River Paper Company, Potsdam, has preliminary plans under way for the rebuilding of the portion of its mill at Hewitville, near Potsdam, recently destroyed by fire with loss reported at $75,000, including equipment.

Ogdensburg, N. Y.—The Algonquin Paper Company has completed plans and will proceed with the erection of an addition to its sulphite mills, comprising four one-story buildings, totaling 100 x 108 feet, with daily capacity increase of 50 tons, estimated to cost close to $200,000, with machinery. A general contract has been awarded to Burns Brothers & Haley, Watertown, N. Y. The Stebbins Engineering Company, Watertown, is engineer.

Winsted, Conn.—The Trinity Bag and Paper Company, 23 West 43rd Street, New York, has taken over the local mill of the Riverton Paper Company, recently placed in receivership, Harold J. Williams, Hartford, receiver. The plant has been closed for a few weeks past, and will resume production at once on its regular schedule, with Chester A. Bentley continuing as manager, as with the Riverton Company.

Philadelphia, Pa.—The Edwin J. Schoettle Company, 533 North 11th street, manufacturer of paper boxes and containers, has asked bids on a general contract for the erection of a new addition to its plant, on site at Eleventh and Brandywine Streets, reported to cost approximately $50,000, with equipment. J. Fletcher Street, 1120 Locust Street, is architect.

Philadelphia, Pa.—The Champion Container Company, Green Lane and Smick streets, manufacturer of paper cans and other containers, has leased the building at the northeast corner of Walter and Morris streets, and will use for extensions. Possession will be taken at an early date. It will be used largely for warehouse and distributing service.

New York, N. Y.—The Amtorg Trading Corporation, 165 Broadway, has been commissioned to make machinery and equipment purchases for the Central Paper Trust in the Soviet Union, Russia, known as the Centrobumtrust, for a new paper and pulp mill to be erected at Balakhna, near Nizzhni Novgorod. The proposed purchases are expected to approximate $3,000,000. Ivan I. Kramtzov, chief engineer, Central Paper Trust, is now in the United States in connection with the development plans, with headquarters at the office of the Amtorg organization.

Cleveland, Ohio—Fire, February 24, destroyed a portion of the two-story warehouse and distributing plant of the Cleveland-Akron Bag Company, manufacturer of paper and other containers, in the vicinity of Broadway and East Twenty-fifth Street. An official estimate of loss has not been announced.

Quebec, Que.—The Anglo-Canadian Pulp and Paper Company has plans under way for its proposed new pulp and paper mill, and is said to be arranging to begin actual construction early in May. It is reported to cost in excess of $1,500,000 with machinery.

Troy, N. Y.—The Yorkshire Corrugated Box Corporation has been incorporated with a capital of $50,000, to manufacture corrugated paper boxes and containers. The incorporators are J. A. and K. Seery, and J. H. Connelly. The company is represented by Dugan & Bookstein, Albany, N. Y. attorneys.

New Companies

Paterson, N. J.—The National Paper Tube Company has been incorporated with a capital of $100,000, to manufacture paper and cardboard tubing and other kindred products. The incorporators are Charles Garrabrant, Albert S. Etanfield and John J. Gustenhoven, 136 Washington Street, Paterson. The last noted is representative.

Wilmington, Del.—The Sanitary Paper Products Company, care of the Corporation Service Company, Equitable Building, Wilmington, has been incorporated with a capital of $300,000, to manufacture paper goods.

Kalamazoo, Mich.—The Paper Products Manufacturing Company has been incorporated with a capital of $30,000, to manufacture and deal in writing papers and other kindred paper goods. The incorporators are Stanley C. Frost, Christian and Harold D. Schrier, 627 Fairbanks Avenue, Kalamazoo.

New York, N. Y.—The Economy Ticket and Label Company has been incorporated with a capital of $20,000, to manufacture paper specialties. The incorporators are A. Hirshfield and A. Torres. The company is represented by D. H. Perlman, 261 Broadway, New York.

Wilmington, Del.—The Cotton Tex Products Company, care of the Delaware Registration Trust Company, 900 Market street, Wilmington, has been incorporated with a capital of $1,000,000, to manufacture paper goods.

Philadelphia, Pa.—C. H. Sprowles' Sons have filed notice of organization to operate at 1619 Ruan street, for the manufacture of paper boxes and containers. A. Ernest Sprowles and Charles H. Sprowles, Jr., head the company.

Boston, Mass.—The Cleveland-Wheeler Corporation has been incorporated with a capital of $25,000, to manufacture and deal in paper products for office service, etc. Alden M. Cleveland, 11 New Boston street, Woburn, Mass., is president and treasurer.

Financial

Kalamazoo, Mich.—The Sutherland Paper Company has filed notice of increase in capital from $1,150,000 to $1,500,000, for general expansion.

Noblesville, Ind.—The Carbonized Paper Company has filed notice of company dissolution under state laws.

San Antonio, Tex.—The Crown Paper Box and Label Company has arranged for an increase in capital from $9,000 to $25,000 for general expansion.

Goes With Androscoggin Pulp Co.

A. W. Roeper, for the past three years night superintendent of the Thorold plant of the Beaver Wood Fibre Company, has accepted a similar position with the Androscoggin Pulp Company, at South Windham, Me.

BLEACHED and UNBLEACHED
SULPHITES
KRAFT PULPS
GROUND WOOD
NORRONA
PULP STONES

PERKINS-GOODWIN CO.
33 WEST 42nd STREET
NEW YORK

PAPER
PRINTING PAPER
of
EVERY DESCRIPTION

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

For the Month Ending December 31, 1925, and for the Twelve Months Ending December 31, 1925 as Compared with Corresponding Months of Previous Year

IMPORTS—PAPER

	December				Twelve Months Ending December 31			
	1924		1925		1924		1925	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paper, except printed matter (total)	.....	10,452,683	.....	10,075,170	.....	118,316,451	.....	119,991,387
Printing paper—								
Standard newsprint ....lbs...free	250,482,105	9,217,111	244,170,265	8,766,146	2,714,466,600	101,297,266	2,896,850,378	103,717,055
Imported from—								
Finland	5,104,195	179,422	1,233,342	37,485	71,279,771	2,250,219	43,369,352	1,328,376
Germany	3,540,918	106,737	2,264,701	70,800	77,801,028	2,357,816	51,730,172	1,606,346
Netherlands	.....	.....	.....	.....	2,152,928	69,021	1,050,608	34,157
Norway	5,154,271	160,208	337,612	11,467	34,521,557	1,106,196	35,129,194	1,068,637
Sweden	11,639,975	352,130	11,255,860	341,513	122,904,391	3,852,204	131,035,514	3,946,463
Canada	217,231,259	8,158,511	214,037,532	7,809,443	2,394,010,464	91,282,525	2,590,648,236	94,253,570
Other countries	7,811,487	260,103	15,041,218	495,438	11,796,461	379,285	43,887,302	1,479,506
All other, n. e. s.....lbs...dut.	1,701,718	77,600	707,853	36,541	26,710,868	1,125,825	16,610,850	809,260
Grease-proof and water-proof papers..lbs...dut.	172,238	16,505	277,642	34,873	1,431,665	161,430	2,278,940	288,971
Kraft wrapping paper.....lbs...dut.	1,907,679	79,195	1,110,789	50,490	28,216,656	1,090,488	14,419,611	605,666
All other wrapping paper.....lbs...dut.	764,052	30,985	212,324	12,367	21,432,512	840,511	5,550,040	269,737
Writing, drawing, bond, etc.....lbs...dut.	317,566	60,517	332,826	68,894	2,746,048	620,464	3,219,715	744,912
Surface coated .....lbs...dut.	169,304	35,190	650,158	46,021	1,946,078	451,954	2,072,545	530,715
Tissue paper .....lbs...dut.	182,605	80,694	204,462	91,196	2,404,799	986,439	2,714,343	1,163,595
Paper boards—								
Pulp boards in rolls.....lbs...dut.	4,729,094	127,371	4,962,012	159,779	77,223,012	2,122,089	72,695,361	1,912,973
Other paper boards, n. e. s.....lbs...dut.	2,615,252	64,072	2,929,255	74,112	31,497,146	738,494	30,357,608	746,320
Cigarette paper, cigarette books and covers .....lbs...dut.	827,590	219,685	1,045,556	277,908	10,980,534	3,028,125	10,651,318	2,934,572
Photographic paper .....lbs...dut.	65,251	22,074	270,326	65,879	3,141,973	643,691	3,469,611	790,776
Hanging paper .....lbs...dut.	818,519	62,440	547,793	65,955	13,991,261	632,662	5,516,346	562,934
Paper boxes .....lbs...dut.	190,237	119,791	180,877	82,065	1,829,521	1,179,441	2,329,394	1,349,525
Duplex decalcomania, not printed ....lbs...free	52,976	13,469	55,548	13,936	526,249	123,633	436,315	111,705
All other .....dut.	.....	225,984	.....	229,008	.....	3,273,939	.....	3,452,669
Books and other printed matter (total).....	.....	1,049,646	.....	918,349	.....	10,061,398	.....	13,376,853
Books and pamphlets in foreign languages .....lbs...free	211,376	143,478	200,807	137,599	2,396,363	1,453,479	2,080,883	1,796,385
Books, maps, music, etc., 20 years old lbs...free	45,988	301,681	50,935	135,560	385,410	1,912,062	432,910	3,460,169
Other books, etc. .....lbs...free	195,416	184,021	245,476	155,837	2,400,324	1,793,836	2,720,413	2,470,108
Books, pamphlets, and music, n. e. s..lbs...dut.	279,348	222,955	324,803	244,461	3,363,451	2,393,168	3,785,788	2,818,180
Maps, charts, and other printed matter n. e. s. .....dut.	.....	75,842	.....	72,352	.....	849,673	.....	893,086
Lithographically printed matter, n. e. s.—								
Cigar bands, labels, and flaps.....lbs...dut.	7,932	11,378	8,481	8,988	107,502	140,840	162,035	147,204
Decalcomanias .....lbs...dut.	15,637	25,149	28,915	41,961	250,774	361,678	300,916	458,269
All other ..... free	.....	.....	.....	.....	.....	3,195	.....	.....
dut.	.....	85,142	.....	121,591	.....	1,153,467	.....	1,333,452

WOOD PULP

Mechanically ground wood pulp.....ton..free	26,096	758,096	29,000	837,334	219,571	7,190,129	295,618	8,517,116
Chemical wood pulp—								
Sulphite, unbleached.....ton..free	65,456	3,480,497	54,889	2,914,228	561,920	30,081,789	579,284	31,542,079
Sulphite, bleached .....ton..free	24,378	1,891,178	21,451	1,713,739	272,369	21,006,233	286,976	22,527,879
Total sulphite .....ton	89,834	5,371,675	76,340	4,627,967	834,289	51,088,022	866,260	54,069,958
Imported from—								
Finland	3,653	214,145	4,148	233,526	54,967	2,877,246	53,126	2,806,164
Germany	8,572	511,382	5,116	251,633	71,998	4,254,052	59,524	3,684,265
Norway	7,904	578,196	4,385	332,287	61,358	4,350,029	68,750	5,175,297
Sweden	31,819	1,722,678	20,177	1,208,578	291,199	16,454,737	264,665	15,599,299
Canada	34,481	2,180,218	39,090	2,499,325	328,251	21,626,089	391,268	25,222,384
Other countries	3,405	165,056	3,424	102,618	26,516	1,525,869	28,927	1,582,549
Sulphate pulp, unbleached (Kraft pulp) .....ton..free	26,010	1,467,266	25,433	1,592,409	278,094	15,915,091	356,073	18,257,446
Imported from—								
Finland	1,888	96,607	1,042	55,852	13,328	644,380	16,524	884,425
Norway	271	14,482	434	28,406	12,558	631,823	9,661	579,281
Sweden	13,527	710,375	13,706	848,929	123,602	6,516,526	148,214	8,359,460
Canada	9,605	606,108	10,251	659,222	124,547	7,912,974	127,539	8,165,142
Other countries	719	39,694	.....	.....	4,059	209,388	4,135	269,138
Sulphate pulp, bleached.....ton..free	2,319	138,874	2,118	120,549	27,613	1,549,629	17,419	989,933
Other pulp .....ton..free	165	11,983	110	7,921	2,127	125,468	2,123	151,726

CHEMICALS AND OTHER PAPER MAKERS' MATERIALS

Colors, dyes, stains, color acids, and color bases, n. e. s. .....lbs...dut.	416,256	574,104	828,074	821,246	3,433,946	4,459,456	5,782,329	7,162,677
Imported from—								
France	8,777	17,051	6,947	10,989	124,958	183,526	118,321	166,275
Germany	220,208	304,264	362,530	393,425	1,652,784	2,079,059	2,932,216	3,757,846
Italy	18,245	23,853	11,829	12,735	162,158	228,875	202,752	245,859
Switzerland	116,518	166,123	411,282	351,278	1,118,215	1,523,829	1,970,951	2,260,165
United Kingdom	26,925	23,568	8,187	9,033	107,510	102,526	170,443	144,621
Other countries	25,583	39,245	27,299	43,786	268,321	341,641	387,646	587,911
Kaolin, china, and paper clay.....ton..dut.	26,256	243,781	26,897	268,410	315,437	3,189,846	332,622	3,195,527

(Continued on page 50)

TEXACO LUBRICANTS

For Pulp and Paper Mill Machinery

OPERATORS OF PULP AND PAPER MILL MACHINERY of any kind whatsoever ARE INVITED TO CONSULT WITH US AT ALL TIMES relative to our detailed recommendations for the most efficient and economical lubricants for their entire equipment.

TEXACO Regal Oils

The Super Oils for the Steam Turbine (and Electric Generator where on the same system).

TEXACO Canopus Oil

For circulating lubricating systems and other conditions of electric generator and motor lubrication.

TEXACO Steam Cylinder Oils

To meet any condition of steam pressure, temperature or moisture.

TEXACO Texol Oils

For safe lubrication of Pulp and Paper Mill Machinery, Engine Parts, Power Transmission equipment and Power Plant accessories requiring high grade machine oils.

TEXACO Nabob, TEXACO Aleph or TEXACO Altair Oils

For Pulp and Paper Mill Machinery and Power Equipment where special conditions Warrant Red Engine or Machine Oils.

TEXACO Motor Oils and Tractoils

For the effective lubrication of Trucks, Tractors, Gasoline Hoists, and general Automotive equipment.

TEXACO Cetus, TEXACO Alcaid or TEXACO Algol Oils

For Air Compressors and Vacuum Pumps.

TEXACO Greases

Throughout the Pulp and Paper Mill, wherever Grease lubrication is necessary. In every consistency from liquid to a hard solid.

TEXACO Crater and TEXACO Thuban Compounds

For the preservation and economical and safe lubrication of gears, chains and wire rope.

Write us specifying your lubricating requirements and we will be glad to send you the special issues of our magazine, LUBRICATION, dealing with Lubrication in the paper industry; and advise you as to the specific Texaco lubricants which will give you the best results.

Texaco Lubricating Engineers are available for your consultation.

Texaco Lubricants can be obtained from the hundreds of Texaco Sales Stations all over the United States, and in many cities in various other parts of the world.

The Texas Company, U. S. A.

Texas Petroleum Products

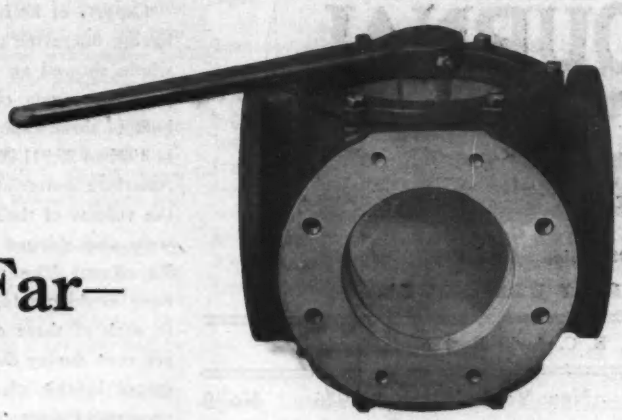
Dept. P.T., 17 Battery Place, New York City

Offices in Principal Cities

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

(*Continued from page 48*)

PAPER AND MANUFACTURES OF	December 1924 Quantity	December 1924 Value	December 1925 Quantity	December 1925 Value	Twelve Months Ending December 31 1924 Quantity	Twelve Months Ending December 31 1924 Value	Twelve Months Ending December 31 1925 Quantity	Twelve Months Ending December 31 1925 Value
CRUDE PAPER STOCK								
Rags for paper stock ..... lbs...free	49,897,545	1,437,429	33,173,645	883,736	507,263,043	11,883,385	572,431,511	15,828,330
Waste bagging, waste paper, etc..... lbs...free	9,173,968	124,651	9,046,855	168,704	108,681,381	1,299,843	128,871,569	2,274,403
Old rope and all other paper stock... lbs...free	6,724,498	393,301	8,760,587	327,014	96,115,238	5,154,319	71,198,576	3,576,230
EXPORTS—PAPER								
Paper, except printed matter (total)	.....	1,782,494	.....	2,328,969	.....	23,823,135	.....	24,334,339
Printing paper—								
Newsprint paper ..... lbs.	2,699,684	136,159	3,885,504	177,366	34,317,278	1,773,187	45,476,381	2,025,153
Exported to—								
Canada	84,097	5,247	111,766	7,585	1,086,772	82,506	1,172,023	80,400
Central America	34,208	2,081	153,012	8,796	678,759	38,055	1,271,285	65,649
Mexico	33,154	2,066	102,373	6,365	2,273,703	118,892	1,845,477	94,097
Cuba	1,336,309	55,848	1,456,525	63,111	18,420,438	826,283	18,271,567	750,238
South America	207,316	13,403	447,359	20,945	2,559,255	150,239	7,500,947	345,516
China	375,623	27,032	593,920	22,355	3,291,317	238,968	5,521,791	240,291
Philippine Islands	538,967	24,698	568,083	26,697	4,261,211	203,427	5,715,760	256,858
Other countries	90,010	5,784	452,466	21,512	1,745,823	114,817	4,177,531	192,104
Book paper, not coated..... lbs.	1,560,601	157,421	1,657,048	169,118	18,581,795	2,078,589	17,347,897	1,934,630
Exported to—								
United Kingdom	.....	.....	16,271	3,024	711,831	139,685	148,682	25,545
Canada	141,622	16,456	226,861	24,720	1,710,720	219,169	2,242,287	273,439
Central America	47,193	4,795	62,230	6,394	623,999	68,145	688,423	72,844
Mexico	136,493	15,452	196,798	23,005	2,086,866	227,866	1,767,477	209,908
Cuba	280,982	30,910	321,180	27,158	3,735,893	415,965	4,687,485	460,579
Argentina	39,768	6,239	51,314	7,561	692,120	67,940	773,802	84,473
Brazil	16,074	1,830	10,261	1,348	372,273	48,420	285,734	40,986
Venezuela	35,942	4,080	144,581	16,055	502,098	56,300	788,908	74,891
Other South America	112,141	11,604	162,644	14,237	1,118,711	133,254	1,321,528	128,310
China	586,867	49,506	182,473	16,973	3,756,155	339,467	947,603	170,477
Philippine Islands	66,164	5,543	170,591	16,052	1,256,632	116,975	1,562,331	145,080
Australia	17,977	1,816	33,907	3,782	532,245	59,689	516,315	57,896
Other countries	79,378	9,190	77,937	8,809	1,482,252	185,714	1,617,322	190,202
Cover paper ..... lbs.	82,879	17,750	135,560	23,570	839,670	161,644	1,214,945	230,779
Greaseproof paper and waterproof paper.... lbs.	85,478	11,182	123,277	18,965	1,567,213	184,675	2,115,356	281,780
Wrapping paper—								
Kraft paper ..... lbs.	55,227	4,408	72,131	6,993	638,588	72,600	794,594	66,338
Other wrapping ..... lbs.	2,089,320	169,226	2,969,939	217,105	24,420,296	1,968,267	27,941,096	2,106,691
Surface-coated paper ..... lbs.	132,038	28,567	320,552	51,424	3,357,609	505,920	3,802,117	561,787
Tissue and crepe paper ..... lbs.	288,541	77,395	450,073	102,521	2,980,456	794,861	3,741,770	958,483
Toilet paper ..... lbs.	378,148	43,415	456,744	50,802	4,345,816	504,525	5,043,550	604,208
Paper towels and napkins..... lbs.	96,802	16,473	167,504	24,036	1,409,409	226,675	1,618,177	244,170
Box board ..... lbs.	.....	.....	4,053,756	121,752	.....	.....	22,482,359	796,089
Bristols and bristol board ..... lbs.	49,992	6,159	187,341	18,386	884,917	106,073	1,132,939	129,357
Other paper board and strawboard..... lbs.	3,718,335	132,880	3,381,551	165,913	71,135,903	2,770,948	32,375,428	1,581,421
Sheathing and building paper ..... lbs.	1,064,830	51,945	1,282,927	55,960	7,149,598	344,976	12,833,552	590,840
Wall board of paper or pulp..... sq. ft.	2,448,292	75,386	1,260,442	45,996	17,490,076	578,908	14,096,802	474,935
Blotting paper ..... lbs.	189,539	22,816	321,306	39,361	2,450,556	296,376	2,919,669	355,782
Filing folders, index cards, and other office forms ..... lbs.	47,862	17,421	60,841	23,586	450,338	160,190	649,275	219,021
Papeteries (fancy writing paper) ..... lbs.	40,808	14,171	63,783	21,515	424,343	153,781	541,157	190,561
Other writing paper ..... lbs.	209,392	40,159	581,707	90,021	4,371,695	792,967	4,021,623	708,820
Cigarette paper and books..... lbs.	16,193	5,395	37,924	15,747	830,647	296,326	493,895	151,762
Photographic paper ..... lbs.	91,493	81,147	164,284	130,928	1,586,309	1,569,633	1,801,841	1,479,115
Paper hangings (wall paper)..... yds.	1,978,382	48,883	1,706,085	47,802	23,215,530	608,684	22,753,684	590,340
Paper bags ..... lbs.	1,088,776	91,400	1,117,644	102,925	10,413,910	958,871	12,883,056	1,134,358
Boxes and cartons ..... lbs.	797,872	73,351	1,348,579	106,156	13,641,538	1,180,050	17,095,240	1,300,957
Carbon paper ..... lbs.	68,393	50,417	129,240	90,855	898,868	707,559	1,093,360	857,613
Envelopes ..... lbs.	215,114	39,904	243,407	47,519	2,443,861	481,318	2,490,768	475,510
Cash-register and adding-machine paper.... lbs.	108,954	11,325	126,005	13,140	1,250,340	137,250	1,632,760	169,427
Other paper and paper products..... lbs.	3,218,031	357,739	2,118,275	349,557	43,692,566	4,498,282	21,428,501	4,114,212
Books, maps, pictures, and other printed matter (total)	.....	1,489,053	.....	1,798,243	.....	19,928,125	.....	21,037,172
Books and pamphlets ..... lbs.	2,546,196	713,166	3,628,566	940,299	33,640,800	9,707,510	42,910,281	10,472,041
Maps and charts ..... lbs.	16,995	18,987	27,411	24,018	198,207	183,919	200,623	220,649
Music in books or sheets ..... lbs.	27,498	23,440	37,115	37,034	618,855	377,758	512,549	334,386
Souvenir post cards ..... lbs.	12,742	7,058	30,662	16,248	352,283	184,930	567,084	237,613
Lithographically printed matter, except post cards and maps ..... lbs.	156,468	84,708	336,590	225,587	2,346,053	1,858,400	3,496,511	2,249,728
Playing cards ..... Packs	832,308	82,956	920,391	88,870	6,869,159	755,737	8,003,373	857,294
Other printed matter ..... lbs.	1,422,863	558,738	3,349,068	466,187	18,349,355	6,859,871	20,988,514	6,665,461
WOOD PULP AND PAPER STOCK								
Sulphite wood pulp ..... tons	1,466	86,639	1,865	119,077	20,731	1,256,195	22,675	1,362,004
Soda wood pulp ..... tons	268	24,446	325	27,508	1,939	182,396	3,455	223,039
Other wood pulp ..... tons	1,806	185,846	905	42,924	5,989	603,479	8,794	856,069
Rags, and other paper stock ..... lbs.	14,973,559	213,967	12,751,932	193,887	121,221,234	2,049,264	176,921,484	3,274,903
PAPER AND PULP MILL MACHINERY								
Paper and pulp mill machinery..... lbs.	606,980	177,076	978,433	234,166	10,146,383	2,130,685	7,364,403	1,717,451



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By Far—

The Most Practical Valve *for* Pulp *and* Paper Mills

Advantages

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3. Equipped with brass plugs thus insuring long wear.
4. No small or intricate parts to wear or break.
5. Flanged for standard cast iron pipe or spiral riveted pipe.
6. Easy to install.
7. Can be installed in limited quarters. No head room required.
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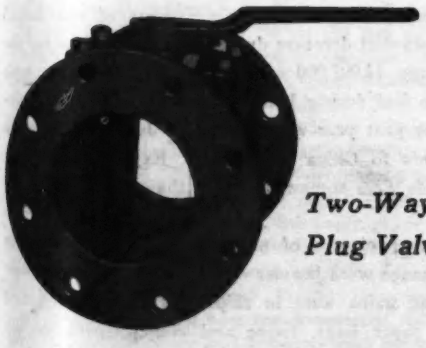
9. Very reasonable in price.
10. Practically no maintenance expense.

Users of the ordinary type of control valve in pulp and paper stock pipe lines have experienced inconvenience and expense in their operation and maintenance. The operation of the valve was hampered because of the excessive friction of the moving parts and the adherence of stock to these parts.

In the design of Valley Plug Valves, the direct needs and requirements for a quick acting, tight closure and economical valve were all taken into consideration. Hundreds of Valley Plug Valves now in operation verify the statement that they are practical and a lasting improvement in paper stock control valves.

The number of repeat orders show the indorsement of these valves. One concern which recently placed its first order for Valley Plug Valves has since ordered an additional ninety. Other mills have sent in five, six, seven and eight repeat orders. Write for complete information on Valley Plug Valves. Booklet mailed on request.



Two-Way Plug Valve

VALLEY IRON WORKS CO.

APPLETON, WISCONSIN

New York Office: 350 Madison Avenue

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PAPER EXPORTS GAIN IN 1925

Paralleling the prosperous condition of the home market, the situation in the paper export trade at the end of 1925 could be viewed with considerably more satisfaction than at any time during the past few years, says the Paper Division of the Department of Commerce in discussing the paper trade during last year.

Not only were exports generally higher than during 1924 but this upward trend showed greater strength during the last half of the year than during the preceding six months. This held true of classes, notably writing papers and boards, in which the total volume of the 1925 shipments did not reach the level of the previous year's, as well as of classes enjoying an increased demand in foreign markets during 1925. Considerable gains were registered in exports to all of the leading markets in Latin America, and while the same cannot be said in regard to sales to the Far East, shipments of a number of the classes of paper and paper products most in demand in that region have shown an improvement during recent months. The total exports of paper and board during the past year, according to preliminary figures, were valued at $24,334,339, an increase of $511,000 or 2 per cent, over 1924 shipments. During the same period paper base stocks to the value of $5,716,015 were also shipped to foreign countries.

Exports of news print during 1925 improved steadily throughout the year, total shipments reaching 45,476,000 pounds, or 33 per cent more than in 1924. American exporters increased their sales with few exceptions in the leading markets of South America and the Far East, while the severest losses were sustained in the neighboring Mexican and Cuban markets. Book paper exports again registered a decrease, but the downward trend has apparently been arrested, exports during the last 8 or 9 months having held fairly steady at 4,300,000 to 4,600,000 pounds each quarter. The decline in comparison with the previous year's shipments was due in a large part to the heavy fall in exports to the United Kingdom and China. Exports to the former, which amounted to nearly 712,000 pounds during 1924 reached only 149,000 pounds during 1925, while in the latter market shipments fell from 3,756,000 pounds in 1924 to 948,000 pounds during the past year. In the Latin American markets exports to Cuba, Argentina, and Venezuela exceeded those of 1924.

Exports of kraft and other grades of wrapping paper, while having fluctuated to some extent from month to month, on the whole showed an unmistakable upward trend during the past year, shipments of miscellaneous wrappings, which form the bulk of these exports, having increased from 24,420,000 pounds in 1924 to 27,941,000 pounds in 1925. Practically all of the Latin American countries, with the exception of Argentina, increased the volume of their purchases during 1925, and larger amounts were also shipped to China and the Philippine Islands in the Far East. The most notable losses in this particular class were in shipments to the United Kingdom and Japan, exports to each of these countries having fallen off approximately 15 per cent during the past year. Proportionately the largest increase in this class occurred in exports of greaseproof and waterproof papers which were 35 per cent larger in volume than during the previous year.

The volume of writing paper exports during 1925 was somewhat under that of the previous year, reaching a total of only 4,022,000 pounds in comparison with 4,372,000 pounds in 1924. As this was one of the few classes, however, in which the average value of the shipments were higher than in the previous year, the total value of these exports show a slight increase. Since the middle of the year a distinct upward trend has been noticeable from month to month in the volume of shipments, and exports of writing paper for the second half of 1925 exceeded those of the previous 6 months by 70 per cent. Losses during 1925 occurred chiefly in shipments to Canada, Mexico, China, Japan, and the Philippine Islands. Exports of papeteries and of envelopes were both greater than in 1924.

The principal decrease in 1925 exports occurred in shipments of paper board and strawboard, including boxboard. While exports of the latter grade were not shown separately in 1924 but were included in the figures covering other paper boards and strawboard, the combined shipments of these two items amounted to 71,136,000 pounds, or nearly 25 per cent more than in 1925. Since July an improvement has been noticeable in these classes, and particularly in exports of boxboard which were more than twice as heavy during the last half of the year as during the preceding six months. Exports of wall board also show a substantial decrease during 1925, shipments for the year totalling only 14,097,000 square feet in comparison with 17,480,000 square feet during 1924. The decline in board shipments during the past year was principally due to the greatly reduced shipments to China and Japan. Exports of bristols and bristol boards were somewhat larger than in the preceding year.

Exports of other classes of paper and paper products in nearly every instance were heavier during the past year than in 1924. Outstanding gains were in shipments of sheathing and building paper, paper bags, tissue and crepe papers, carbon paper, boxes and cartons, and toilet paper, all of which show an increase of $100,000, or more in the value of the 1925 exports. Exceptions were cigarette paper, paper hangings, and classes of paper and paper products not shown separately.

Paper Plate Co. to Locate in Utica

The Servadish Paper Plate Company, of Norristown, N. J., is to establish a plant in Utica, N. Y., for the manufacture of paper plates, according to announcement made by the Industrial Advancement Corporation, a Utica organization formed for the purpose of securing new industries. The new plant will employ between 40 and 50 persons and will secure its raw materials from Northern New York paper mills.

The location for the new plant has yet to be selected although several pieces of property are being considered. A new and modern plant is to be erected, machinery for which is already being manufactured. When the plant is completed this equipment will be ready for installation.

The cost of the new plant and equipment will be defrayed by local interests, it being proposed to raise $175,000 for this purpose. The Industrial Advancement Corporation will invest $50,000 and the remaining $125,000 will be subscribed by local citizens. Debenture bonds running fifteen years and paying 7 per cent will be issued.

Before reaching an agreement with the Servadish Company officials of the Industrial Advancement Corporation obtained a survey from Lockwood, Greene & Co., of New York City, industrial engineers, and made a study of the company and its prospects. The Servadish product it is stated, is coming into wide use in hotels and restaurants and also for picnickers. The paper plate is about a foot square, divided into four compartments, and sets in a shallow tray. The plates are made from heavy paper. One side is dipped into a cellulose substance which gives it a hard surface when baked at a high temperature. The plates are given their shape by being stamped and baked while still moist.

Lawrence Luellen, president of the Servadish Paper Plate Company, is the inventor of the paper cup and is vice president and a director of the Dixie Cup Company, of Easton, Pa. The Servadish Company holds patents on its product.

As soon as the financial arrangements are completed a site will be selected and plans drawn for the new plant. It is expected that construction work will start in the spring.

Boston Demand Continues Good

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, March 1, 1926.—Good business, coupled with deeper tone of confidence and optimism than has prevailed for some time, is shown in this week's survey of the paper trade here. In fact good business has been the order since the first of January. With the return of many of the district's leading paper men from the New York convention there seemed to be noticeable throughout the trade a desire for even bigger and better things. Several of the leaders were frank to admit that the New York session had a lot to do with it.

In answer to the question "What did you get out of the convention?" one of the city's best known paper merchants said to the correspondent; "I got this. I found that the real worth while men at the convention were not whining. They were doing. They were optimistic. They were confident. They feared nothing. I found a wholesome, healthy attitude toward the paper industry in general. I came home determined more than ever to stop 'wondering' and do a little more."

From various sources in the fine paper grade trade came word that business was "booming," that is merchants were having about all they could do to take care of deliveries, having fallen behind during the bad weather. Printers demands are heavy. Also there is a demand just now for commercial stationery and bookings. Social stationery and announcement houses are taking care of generous spring orders and the greeting card stock men are in the market for material. Prices have not changed to any marked degree in the fine grade lines.

The box board men are among the optimistic too. Just now they are sharing in some good orders and most of the merchants predict indefinite good business, due chiefly, they say, to generally improved conditions in certain industries that buy their box boards from the Boston men. Prices of chip, news, and straw remain the same.

All grades of coarse papers are in steady demand and prices have not changed. The demand for kraft is noticeable and the era of price cutting seems to have eased up considerably.

The raw stock end of the business is the one division not sharing in the general good business. Although the predictions had been that good business would start in this branch of the industry in February, this month showed up worse than last December, one dealer said, and last December, he added, was about the worst ever. The mills are pretty well stocked up and only buying small amounts when actually in need of something special. They appear to have enough new stock to last them until April, having bought heavily last fall, it is explained.

United Paper Co. To Build at Tampa

Contract for the erection of the $75,000 building of the United Paper Company on Ella Mae street, Tampa, Fla., has been awarded to Logan Brothers, contractors, work will start Monday. The new plant will be completed and ready for occupancy May 1.

The building is to be of brick and steel construction, two stories high, and will face 109 feet on the tracks of the Seaboard Air Line railroad. It will be 258 feet wide at the front and 304 feet wide at the rear.

The new plant will be considerably larger than the present building of the company, the increase being in keeping with the growth of the business. The firm now employs about 75 workmen. It will contain every convenience, including showers, washrooms and dressing rooms for both white and negro laborers. Provisions for ample lighting have been made in the plans which call for 14 feet of window space in every 20 feet of wall on both stories.

The United Paper Company, with headquarters at Atlanta, is the largest individual fruit and vegetable wrapper concern in the country, according to Louis Wellhouse, Jr., treasurer of the company, who is also supervisor of the Tampa branch. The sales territory covers practically all of the United States.

Mr. Wellhouse stated that with the increased facilities of the new plant they hoped to be in a position to give Florida citrus growers even better service in furnishing fruit wrappers than in the past.

Louis Wellhouse, Sr., of Atlanta, is president of the company, and Alvin Wellhouse is vice-president. B. L. Robinson is manager of the local plant.

Spalding Paper Co. to Build Mill.

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., February 25, 1926.—The Spalding Pulp and Paper Company which was recently announced as a tentative organization, is now practically assured, since a meeting of financial interests held in Portland, Oregon, February 17. A capital of $1,000,000 was authorized at this meeting, $600,000 to be in common stock and $400,000 in preferred stock. The head office will be in Newberg, Oregon, on a site next to the Spalding Lumber Mill on the Willamette River. Charles K. Spalding will head the new concern. Others interested are S. L. Parrett, president of the U. S. National Bank, Newberg; W. H. Woodworth, president of the First National Bank, Newberg; Charles B. Wilson, president of the Newberg Chamber of Commerce; H. C. Spalding, Newberg; Walter Spalding; Salem, and R. H. Mills, Salem, and several other men from various adjacent cities and towns.

Work will start within ninety days it is announced. The plant will be designed to make sulphide paper. At the beginning one paper machine will be installed of the latest type, with two digesters and a large boiler. The building will be two stories of concrete construction.

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They welcome the opportunity to confer with you on points of Quality, Economy and Service.

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Section of the

Technical Association of the Pulp and Paper Industry

AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.

Conducted by W.G. MacNAUGHTON, Secretary

Lubrication of Paper Mill Machinery

By Allen F. Brewer *

Lubrication in the paper industry is one of the outstanding factors of machine maintenance, and economical operation. In general it is coming to receive more and more attention, as the benefits to be derived therefrom are appreciated. Decrease in the cost of lubricants per ton of finished paper is but a detail, though in dollars and cents it may appear to be of primary importance. More particularly are we interested in reductions in cost of maintenance, increased production, a lower rate of depreciation, fewer shutdowns and a decrease in power consumption. All these are made possible by careful selection of oils and greases to meet the operating conditions involved and more attention to their judicious application to avoid waste, damaged products and injury to wearing elements.

In an analysis of paper mill lubrication the several stages of operation will be discussed in their respective order, to facilitate study and reference. Essentially this can be divided into two parts i. e.,

(a) Preparation of the raw product or pulp and
(b) Conversion of this latter into paper.

Pulpwood and Wood Pulp Production

Steam Cylinder Lubrication

In a logging camp it is impractical to use or stock more than one or two grades of steam cylinder oil. Therefore a lubricant capable of meeting a wide range of conditions satisfactorily is necessary. Great care should be exercised in selecting a suitable grade as lubrication conditions are severe and vary considerably. Particular difficulty is often experienced due to uncertain feed water conditions, foaming and priming.

For these reasons it is desirable to use a high compound cylinder oil containing from 6 to 10 per cent suitable fatty oil with a viscosity about 130 seconds viscosity Saybolt at 210° F.

Lubrication of Bearings and Other Moving Parts of Prime Movers

Miscellaneous engine parts, machine slides and bearings if provided with close fitting bearings and bottle or other automatic oilers should be lubricated by a straight run oil with viscosity of about 300 seconds at 100° F., if the bearings are worn or loose or hand oiled, an oil with a viscosity as high as 750 seconds Saybolt at 100° F. may be required.

Internal Combustion Engines

When selecting a tractor or motor oil for a gasoline or kerosene engine in a lumber camp, the weather temperatures encountered are of greater importance. No one thing shortens the life of an internal combustion engine more than the use of an oil which will not flow freely at a cold start. Furthermore, even with the proper oil, racing a cold engine to warm it is bad practice. There are many other factors governing the choice of a suitable grade and a chart should be consulted recommending specific grades for each engine as published by representative oil companies and engine manufacturers. Even then proper attention to low temperatures found in logging in northern winter climate is often overlooked. If the temperature is below frost but above 10° F. an oil with a viscosity of from 55 to 75 seconds Saybolt at 210° will usually satisfy most conditions met by tractors, trucks and hoists. But if the temperature often goes below 10° F. a straight run motor oil with at least a 0° F. pour test and a viscosity from 45 to 48 seconds at 210° F. should be used on trucks and hoists and 52 to 57 second at 210° F. for tractors.

Gears, Chains and Wire Rope

Exposed gears, wire rope, and caterpillar tractor link pins and rollers, if subjected to snow, ice or water conditions, are difficult to lubricate, unless an oil with the necessary characteristics is selected. Excessive wear, rust and power consumption result if careful lubrication of this equipment is neglected. The problem can be successfully solved by the hot application with a paddle or brush on clean dry gears of an adhesive straight run mineral oil with a viscosity of about 1000 seconds at 210° F.

When it cools it leaves a heavy non-fluid film on the gear teeth which is almost impervious to action of ice and remains in position under severe pressures. The same lubricant can be used to great advantage to lengthen the life of wire cables. A moment's thought will show that the individual strands move on one another when in use, causing rapid wear unless contact between the strands is prevented by the presence of a lubricant. Furthermore, the ice and water conditions met with, cause considerable internal rust which acts as an abrasive, in addition to the fine dirt particles carried in with the ice. These troubles can be minimized to a surprising degree and the wire rope will last years instead of months, if it is periodically run through a trough of the above described lubricant heated to a thin fluidity. This permeates the strands and on cooling leaves a firm lasting cushion of non-fluid oil throughout the former which will repel further entrance of water or ice. Rusting of chains can be prevented in the same way,

The Jack Ladder

The only lubrication which will stand up under the water conditions involved here is the hot application of the viscous lubricant described above for gears and wire cables in the logging camp.

The conveyor bearings are too often lubricated by hand oiling. In this case an oil of a viscosity not less than 650 seconds at

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100° F. should be used and even this must be frequently renewed. If they are lubricated with grease, well and good, providing they remain cool. A medium grease of good quality will answer provided it is made to withstand the water conditions. Wick feed cups would pay their cost in saved oil, let alone reduced wear and saving of labor and cutting out of the uncertainty of the human element. The sprocket gears under water at the lower end of the conveyor are usually lubricated by water and while at the slow speeds water lubricates and prevents undue wear, there is considerable corrosion and relatively short life, unless compression grease cups are provided.

Slashers and Swing Saws

Lubrication of saw mandrel bearings is rarely neglected as is the case with many bearings operated at lower speeds. Nevertheless hand oiling of plain bearings is not at all satisfactory unless frequently attended to, which at the best is wasteful of labor as well as of oil. The operator almost always applies too much at a time in hopes of lengthening the interval until he must attend to it again. This excess is, of course, wasted. A wick feed cup would render lubrication automatic and sure for much longer periods.

If bearings are hand lubricated an oil of about 500 seconds viscosity at 100° F. should be used—the slight loss of power resulting will be compensated for by lower oil consumption. If they are ring or wick oiled an oil of a viscosity as low as 200 seconds will be best unless the bearings are loose when a slightly heavier oil is preferable. Grease cups require a grease of medium consistency.

Conveyors

Although conveyor lubrication conditions are severe due to continuous running they operate so slowly that they often receive no lubrication other than their shaft bearings and the bearings of rollers which usually are provided with grease cups. This equipment would have a longer life if the gears, sprocket teeth and chains were brushed with a hot adhesive lubricant as described above under gears and chains. When the pulley sprocket wheel and drive shaft bearings are ring or wick oiled, and close fitting an oil about 300 seconds viscosity at 100° F. is suitable. If the bearings are worn or loose or hand oiled, an oil of 650 seconds viscosity at 100° F. should be used.

This oil should be compounded to meet water conditions whenever the bearings are subjected to severe splashing from wet logs.

Barkers

On such equipment only the bearings of the supporting rollers are designed, strange as it may seem, to prevent water flowing over. They are satisfactorily lubricated with a medium consistency grease. The shaft operating the pinion lies parallel to the drum, and its bearings are rarely designed to prevent the washing action of water which is continually flowing from the barker. These bearings are usually hand oiled and packed with waste as a means of holding the oil which should be compounded to serve under water conditions, and have a viscosity of about 650 seconds Saybolt at 100° F.; this condition could be improved with wick oilers and an oil of viscosity of about 300 seconds at 100° F. The gears, sprockets and chains should have hot applications of an adhesive, straight mineral lubricant. With all the improper lubrication of these bearings very little trouble actually results on account of their being both cooled and lubricated by constant water splashing.

Another common form of barker consists of a large revolving disc set with knives like a carpenter's plane against which the logs to be barked are pressed. The bearings are often provided with an automatic oiling device such as ring, chain or collar oiler, if they are of the plain type wick feed cups can also be adopted. The viscosity of the lubricant should be 200 seconds at 100° F.; however, a heavier oil, of about 500 seconds viscosity at 100° F. should be used if hand oiled. If grease cups or grease is packed in the housing, a medium body product should be used.

Splitters

Splitters are not difficult to lubricate, a medium grease packed in the housing being very satisfactory. If hand oiled an oil of about 300 seconds viscosity should be used although if fitted with an automatic oiler a viscosity of 200 seconds will serve. The guides if snug or cold should be lubricated with an oil of a viscosity from 680 to 780 seconds at 100° F.; if worn or loose or in summer an oil of 100 seconds viscosity at 210° F. should be used.

Chippers

Chipper bearings are difficult to lubricate. The disc weighing several tons runs at about 225 r.p.m. and strikes a blow heavy enough to chip off a clean slice from the end of a 12-inch hardwood block. The friction results in heating of the disc. This heat is readily conducted to the bearings which consequently tend to run hot. In addition to this temperature and the weight of the disc on the bearing, there is the shock and strain every time the knife hits a wood block. The bearings are usually plain and hand lubricated, for which an oil of 100 seconds viscosity at 210° F. should be used. If grease packed a special high melting point grease is desirable. The lubrication of these bearings will frequently be very much improved by installation of a wick oiler. When the bearings, including the thrust are fitted with wick or other automatic oiling devices an oil of about 55 seconds viscosity at 210° F. will serve.

Chip Screens

Horizontal chip screens are shaken by eccentrics which are lubricated usually by compression grease cups with a medium bodied grease. Other bearings can be readily lubricated by hand with an oil of 400-500 second viscosity at 100° F.; when bearings are close fitting and automatically oiled a viscosity of 200 seconds is satisfactory.

Rotary screens are usually supported on rollers whose bearings can be lubricated with an oil of 300 seconds viscosity when automatically oiled and about 500 seconds viscosity when bearings are worn or hand oiled.

Crushers and Rechippers

Both of these machines operate at high speeds,—the crusher sometimes as high as 3,000 r.p.m. Both machines are usually hand oiled. An oil of about 700 seconds viscosity should be used on crusher bearings and about 950 seconds viscosity for rechipper bearings. When bearings are close fitting and automatically oiled an oil of 300 seconds viscosity should be used for the crusher and 400-500 seconds viscosity at 100° F. for the rechipper. When bearings are grease lubricated a special hard, high melting point grease should be used.

Wood Pulp Manufacture

Grinders

Wood pulp grinder bearings are among the most difficult to lubricate in the industry. Besides the heavy pressure from the enormous weight of the grind stone there is the added pressure in forcing the wood blocks against it.

Furthermore, few grinder bearings are guarded against the entrance of water which makes lubrication even more difficult. As a result these bearings usually run warm even when water jacketed. So much trouble has been experienced that lignum vitae bearings lubricated with water are often installed to replace metal bearings. Plain bearings lubricated by hand should be adapted for wick feed oilers, the amount of oil delivered being easily controlled by the number of wicks. Lubrication can be much improved by fitting a guard on the shaft for the purpose of throwing off water by centrifugal force before reaching the bearings.

Close fitting bearings automatically lubricated when protected from water require a straight mineral oil of about 55 seconds viscosity at 210° F.; and if bearings are only partially protected an oil compounded to meet water conditions should be used.

Loose or worn bearings automatically lubricated, and hand oiled bearings if water protected should be lubricated with a straight mineral oil of about 80 seconds viscosity at 210° F. and a compounded oil to meet water conditions when unprotected.

When bearing caps are provided with pockets for grease packing a hard high melting point waterproof grease should be employed, though again wick feed oilers could be installed with savings in lubrication cost, labor cost and bearing metal as well as lower power consumption.

Sliver and Pulp Screens

If bearings of such screens are automatically lubricated and close fitting, an oil with a viscosity of about 300 seconds at 100° F. will serve the purpose. If the bearings are worn or hand oiled, an oil of about 500 seconds at 100° F. will be required. The eccentrics are best lubricated with an oil of 500 seconds viscosity at 100° F., unless provided with grease cups for which a grease of medium consistency should be used. Trotter cams, gears, chains and sprockets require the hot application of an adhesive lubricant as described under heading of gears, chains and wire rope.

Stock Pumps

Fan pump bearings are usually ring oiled for which an oil of about 200 seconds viscosity is suitable. If the bearings are worn, or if hand oiled, a viscosity of 300 seconds should be employed. Geared plunger pumps are usually lubricated by compression grease cups, bottle oilers, or hand oiling. An oil of 300 seconds viscosity at 100° F. should be used for self-oilers and 500 seconds, for hand oiling; a medium cup grease in the grease cups and a fairly heavy adhesive gear lubricant for such gears as are involved.

Pulp Thickener and Wet Machines

Machines of the above type are constantly splashing water and the bearings being rarely protected, should be lubricated with an oil properly compounded with a fatty oil to meet this condition, having a viscosity of about 700 seconds at 100° F. When grease cups are installed or plain bearings contain grease pockets in the housings, a grease prepared to meet water conditions should be used.

Rag, Straw and Waste Paper Machines

The bearings of such machines should be lubricated with an oil of about 200 seconds viscosity unless worn, loose or hand oiled, when a viscosity of 500 seconds is required.

The boilers often weigh 9,000 pounds and contain 9,000 pounds of rags, producing considerable pressure on bearings which operate at high temperatures on account of steam required in the process.

Therefore, even in the newest types with ring oiled bearings, an oil of at least 500 seconds viscosity should be used. If grease lubricated, a hard special high melting point grease is required. If the steam joints are provided with grease cups, a special grease prepared with a heavy bodied oil should be used.

The pulping engine is a special machine which is frequently used for waste conversion. It is designed to defiber the paper without undue additional shortening of the fibers which have already undergone the cutting action of the beaters when originally manufactured into paper.

Pulping engine bearings are best lubricated with a straight run mineral oil of about 300 seconds viscosity at 100° F., unless the bearings are worn or hand-oiled when an oil of 500 seconds viscosity at 100° F. should be employed.

British Paper Makers in New York

P. A. Morton, London manager for Tullis, Russel & Co., Ltd., Markinch, Scotland, is spending a few weeks in New York on business for his firm which makes high grade paper specialties. With Mr. Morton is Dr. J. L. A. Macdonald, chief chemist for the firm. They were in attendance at the convention of the Technical association of the Pulp & Paper Industry.

Seymour Mills Sold

With the incorporation of the Seymour Paper Company, of Seymour, Conn., the control of mills of the Paper Products Manufacturing Company in that New England town passes to new ownership. An application has been made for the incorporation of the Seymour Paper Company by Pennsylvania interests, including Frank Peterson, superintendent of the Ajax Paper Mills, Buck Run, Pa.; C. A. Ernst, of Swarthmore, Pa., identified with the local branch of the Paper Products Manufacturing Company; W. S. Sprague, president of the Paper Products Manufacturing Company, Swarthmore, Pa., former owners of the Seymour Mills, and Albert T. Tong, superintendent of the Connecticut mills.

Before the organization of the Seymour Paper Company the mills were owned by the Paper Products Manufacturing Company, of Swarthmore, near Philadelphia, and were devoted to the manufacture of tissues used by the latter concern in the production of its own line of crepe paper napkins and table cloths, and for trade consumption. Under the new organization the mills have been sold to Frank Peterson and A. T. Tong, who have become associated with the former owner, W. S. Sprague, and with C. A. Ernst in the reorganized company to be in operating control by March 1. With the combined production of the Paper Products and Seymour organizations, there will be produced 3,000,000 napkins and table cloths per day. While the local plant of the Paper Products Manufacturing Company will continue to concentrate on the crepe paper specialties, which it always has produced, the Seymour Mills will be devoted to the manufacture of all grades of tissues in addition to those consumed in the crepe specialties.

Navigation on Fox River

The United States Government will put on four new steel boats on the Fox River this year, these to take the place of the obsolete wooden ones. A new steel tug and three steel barges will ply the waters of the Fox. They are to be commissioned in the early spring by the Milwaukee office of the United States engineers of the War Department.

These improvements announced by the government seem to indicate that there is no truth to the current reports that the government is contemplating abandoning its navigation improvements on the Fox River. Paper Mills of this region are making large use of the river for navigation, especially in the importation of coal for steam power. Should the maintenance work at the canals and locks and the dredging which are going on every year be abandoned, some of the paper mills would suffer visibly.

Fox River navigation has steadily increased since the engineering office was moved from Oshkosh to Appleton in May, 1919. Coal is the principal commodity transported by barges on the river. During 1925 freight with a total tonnage of 332,889 tons and a value of $1,490,039 was handled on the river. Of this 274,962 was handled up-bound and 57,927 down-bound.

W. C. Hamilton Sons Mills Electrified

Equipment of the Jordans with synchronous motors and the paper machines with single drive motors, Ward Leonard control, and speed regulators, were among some of the electrical improvements which were made in the W. C. Hamilton Sons mills at Miquon near Philadelphia in the year. The installation of noncondensing turbine running parallel with the power generated by a central station is a noteworthy achievement in the electrification of the Hamilton mills and in fact an innovation in the industry that very few power companies will parallel with industrial plants. By this method, the money required for the installation of a power plant and generating apparatus can be profitably applied to installing paper making machines. Through this system of electrification the Hamilton company is able to load only sufficient quantity on the turbine to limit steam to the required process work. When the steam requirements fall off the rear pressure governor automatically throws the load on the purchased power.

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Chemistry of the Sulphite Process

IX. The Influence of Hydrogen-Ion Concentration

By R. N. Miller,[1] W. H. Swanson [2] and Ragnar Söderquist [3]

In the eighth paper of this series (*) it was shown that the reactions of sulphurous acid and bisulphites upon wood were such that the carbohydrate materials of the wood were attacked in the same manner as with dilute hydrochloric acid, and indications were obtained that the hydrogen-ion concentration might have a determining influence on the pulping action. It was also shown that the carbohydrate materials of the wood could be differentiated in some degree and parts dissolved without accompanying removal of the lignin. The reactions of pulping in fact appeared to be a collection of simultaneous independent reactions proceeding at different rates to a limit defined by the stability of the different parts of the wood toward the conditions of the experiments. The work reported in the present paper was designed to distinguish, if possible, between the various reactions involved and to determine the influence of hydrogen-ion concentration on each.

The technique of cooking was the same as that described in the eighth paper of this series. It consisted, briefly, in cooking about 15 grams of spruce wood, ground to pass a 40 and remain on a 60 mesh screen, in a specially constructed autoclave with the various acid solutions. The analytical methods employed were those used in the previous work, and the same restriction is to be observed, *viz.*, that the terms "lignin" and "cellulose" as used herein refer only to the materials defined as such by the analytical methods.

The first series of cooks was performed with acid mixtures whose concentration was 0.2 normal with respect to sodium bisulphite and also with respect to the various acids added. The relative acidity of the mixtures was measured by the rate of sugar inversion, as determined with a polariscope. The acidity of the mixture of hydrochloric acid and sodium bisulphite was taken as standard and was assigned an arbitrary value of 100 units. The acidities of the other acid mixtures were expressed in units of the same scale. Results of the first series of cooks are shown in Table 1.

TABLE 1

RESULTS OF COOKING WITH SODIUM BISULPHITE AND VARIOUS ACIDS

Acid used	Relative acidity	Yield of pulp, based on weight of wood Per cent	Cellulose, based on weight of wood Per cent	Lignin, based on weight of wood Per cent
Hydrochloric	100	59.03	40.50	17.50
Sulphuric	73	61.90	44.80	15.60
Oxalic	35	65.77	47.40	16.82
Sulphurous	23	61.96	47.10	12.75
Phosphoric	17	66.49	47.25	17.50
Tartaric	12	67.84	47.80	17.95
Acetic	0	75.57	50.70	20.25
None	0	83.68	53.65	22.75

Sodium bisulphite, 0.2 N. in all cooks except the last, in which it was 0.4 N.
Acids in all cases, 0.2 N.
Wood analysis: Cellulose, 58.95 per cent; lignin, 27.75 per cent.
Temperature, 130° C.
Time, 6 hours.

In the second series the cooking liquor was made up of 0.2N sodium bisulphite and such amounts of the various acids used that the hydrogen-ion concentration, as determined by colorimetric methods (using the Clark & Lub indicators), was constant and corresponded to a pH value of 2.1. The results are shown in Table 2.

In the third series (see Table 3) a constant concentration of sulphurous acid was used and the hydrogen-ion concentration of the solution was varied by the addition of different amounts of sodium bisulphite. All values for hydrogen-ion concentration in the third series, expressed in terms of pH, were obtained by the use of Clark & Lub indicators.

Unstable Carbohydrates

Considering first as an independent reaction the removal of the less stable carbohydrate material from the wood, the data of all three series of tests go to show a result that would be expected from the previous work, namely, that the cellulose in the residue decreases with increasing hydrogen-ion concentration. The apparent exception presented by the four cooks of the first series in which the cellulose value approaches a constant between 47 and 48 per cent will explain itself when it is recalled, from the previous paper, that a portion of the cellulose is more resistant than the rest. The nearly constant value shown in Table 1 is that for the more resistant part. Where the degradation of the wood is not so complete, as in the cases represented by Table 2, the value for cellulose shows a constancy comparable to that of the hydrogen-ion concentration. In the results given in Table 3 the variation in cellulose value follows

TABLE 2

RESULTS OF COOKING WITH ACID MIXTURES OF CONSTANT HYDROGEN-ION CONCENTRATION

Name	Cooking Acid — Normal	Cooking Acid — $NaHSO_3$ Normal	Yield of pulp, based on weight of wood Per cent	Cellulose, based on weight of wood Per cent	Lignin, based on weight of wood Per cent
Sulphurous	0.208	0.200	64.94	49.55	13.61
Hydrochloric	0.0562	0.200	71.81	50.01	19.40
Sulphuric	0.0625	0.200	70.86	49.67	18.83
Oxalic	0.1385	0.200	70.28	49.37	19.09
Phosphoric	0.281	0.200	69.19	49.18	18.25
Tartaric	0.495	0.200	66.48	48.01	17.17

Cooking acid: 200 cc. mixture of sodium bisulphite and acid as listed.
pH value of mixture, 2.1.
Temperature, 130°—0.5° C.
Time, 6 hours.
Wood analysis: Cellulose, 58.95 per cent; lignin, 27.75 per cent.

TABLE 3

SULPHUROUS ACID COOKS WITH VARIABLE HYDROGEN-ION CONCENTRATION

Acid Analysis: Total SO_2 Per cent	Free SO_2 Per cent	Combined SO_2 Per cent	H_2SO_3 Normal	$NaHSO_3$ Normal	pH before cooking	pH after cooking	Yield of pulp, based on weight of wood, per cent	Cellulose, based on weight of wood, per cent	Lignin, based on weight of wood, per cent
1.92	1.60	0.32	0.4	0.1	1.5	1.0	48.21	46.21	2.37
2.24	1.76	0.48	0.4	0.15	1.6	about 1.0	48.98	47.30	1.85
2.56	1.92	0.64	0.4	0.2	1.7	about 1.0	49.61	47.73	0.83
3.20	2.24	0.96	0.4	0.3	1.9	about 1.2	52.04	48.75	1.78
3.84	2.56	1.28	0.4	0.4	1.9	1.4	53.29	49.46	2.37
4.48	2.88	1.60	0.4	0.5	1.9	1.4	53.21	50.21	2.44

All cooks at 120° C. for 18 hours.
Wood analysis: Cellulose, 58.95 per cent; lignin, 27.75 per cent.

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the variation in pH value quite consistently; *i.e.*, the amount of cellulose in the residue decreases with increasing hydrogen-ion concentration. As regards the removal of the less stable carbohydrate material in the sulphite cooking process, then, the previously expressed view of a simple acid hydrolysis of wood finds confirmation.

Lignin

Considering the lignin removal, however, it requires closer scrutiny of the results to decide what is the active constituent of the cooking liquor. It is quite evident that in Series 1 and 2 the reaction on the lignin is decidedly the most drastic in those cooks containing sulphurous acid and no other, even though as in Series 1, the acidity of some is greater than that of the cook with sulphurous acid or, as in Series 2, the acidity of all is the same. The potentially larger amounts of HSO_3 or SO_3 ion in the mixtures showing the greatest degree of lignin removal tempts one to attribute the greater activity to these ions but in Series 3 it is seen that the addition of the larger amounts of sodium bisulphite is accompanied by an actual decrease in the extent of lignin removal. Hence the more effective cooking action noted *can not be attributed to the bisulphite or sulphite ion alone.*

If Series 3 is again examined for a variable to which to attribute the successive degrees of lignin removal, a significant factor will be found in the variation in ionic equilibrium which occurs upon the addition of more and more sodium bisulphite to a fixed concentration of sulphurous acid. Up to 0.3N the addition is seen, by the increasing values for pH, to reduce the hydrogen-ion concentration in the solutions at the beginning of the cook. Beyond 0.3N the initial value of pH becomes constant, but the pH values at the end of the cook show that the *average* hydrogen-ion concentration must have been less with increasing bisulphite. Such a diminution can come about only by a depression of the ionization of the sulphurous acid, and the net result of the addition of bisulphite is to reduce the amount of sulphurous acid present to $H^+ + HSO_3$ in the solution. The concentration of sulphurous acid present as $H^+ + HSO_3$ (described hereafter as ionized sulphurous acid), then, is a factor which varies in the same direction as the degree of removal of lignin. The apparent exception to this trend in the first two cooks results from a deficiency in base, a phenomenon which is considered later in this paper. With a decrease in ionized sulphurous acid, therefore, as measured by the accompanying decrease in hydrogen-ion concentration, the removal of both cellulose and lignin decreases.

When the cooks in Series 2 are examined with the concentration of ionized sulphurous acid in mind, it is apparent that, the hydrogen-ion concentration having been adjusted to the value 2.1, the concentration of sulphurous acid, both ionized and unionized, in all mixtures except that containing sulphurous acid must have approximately the same value. In the latter the sulphurous acid added as such furnishes a greater concentration of ionized sulphurous acid than can be present in any other cook of the series, and the greater reaction on the lignin is apparent.

In the first series of cooks the conditions are quite different, but the principle can be shown to hold. The lowest lignin yield occurs in the cook containing the added sulphurous acid and, consequently, the largest amount of ionized sulphurous acid. In those cooks in which the acidity was greater than that in the sulphurous acid cook it might be thought that the greater acidity perhaps indicated greater ionized sulphurous acid concentration and that under the present theory lignin reduction should be greater. If, however, the conditions of equilibrium between hydrochloric, sulphuric, etc., acids and sodium bisulphite in these cooks are considered it can be seen that the concentration of ionized sulphurous acid will approach a maximum limit. Taking hydrochloric acid and sodium bisulphite in equivalent proportions in solution, as in the case here, the greater portion of the hydrogen-ion present results from the ionization of hydrochloric and not sulphurous acid. The ionization of sulphurous acid, which is much less than that of hydrochloric under comparable conditions, is repressed to an even greater degree by the presence of the strongly ionized hydrochloric acid. The net result of the mixing of acid and salt will be to produce a solution containing a relatively high concentration of hydrogen-ion, but lower concentration of HSO_3 ion, and in effect a lower concentration of ionized sulphurous acid, the limiting condition of which would be controlled partly by the amount of sodium bisulphite furnishing the HSO_3 ion in the solution.

In the case of the solutions containing acids weaker than sulphurous, the limiting factor is the concentration and degree of ionization of the weak acid, which limits the amount of hydrogen-ion that can be available for the formation of ionized sulphurous acid. It is logical, then, to attribute the activity of the cooking solution in this series also to the presence of ionized sulphurous acid.

To afford a comparison at the same degree of cooking as in Series 1 and 2, Series 4, the results of which are shown in Table 4, is included.

TABLE 4

SULPHUROUS ACID COOKS WITH VARIABLE HYDROGEN-ION CONCENTRATION

Cook No.	Oven-dry pulp, per cent	Cellulose, based on weight of wood, per cent	Lignin, based on weight of wood, per cent	Total SO_2 per cent	Free SO_2 per cent	Combined SO_2 per cent	H_2SO_3 per cent	$NaHSO_3$ per cent	pH before cooking	pH after cooking
148	65.98	48.8	15.77	1.32	1.00	0.32	0.92	1.05	1.85	1.3
149	66.90	51.4	14.80	1.98	1.33	0.65	0.87	2.12	2.0	1.7
150	67.56	52.0	14.88	2.58	1.63	0.95	0.87	3.09	2.1	1.8
151	68.06	52.6	15.0	3.23	1.95	1.28	0.87	4.14	2.15	1.9

Cooking time, 6 hours.
Temperature, 130° C.
Acid: 0.2 N. H_2SO_3; 0.1, 0.2, 0.3, 0.4 N. $NaHSO_3$.

In the commercial production of sulphite pulp, aside from the engineering difficulties involved in preparing and handling solutions of sulphurous acid much more concentrated than those at present employed, the operator seems to be confronted with a sort of law of diminishing returns in that the increase in concentration of ionized sulphurous acid, the effective part of the cooking chemical, is not directly proportional to the increase in concentration of sulphurous acid. It has been shown in the previous paper, however, that changes in concentration of cooking chemical over rather wide ranges were far less effective than changes in temperature in increasing the rate of lignin removal.

Having established the view that the pulping action consisted of at least two types of reaction, one the hydrolysis of the carbohydrate material, the other the removal of lignin through the reaction of the ionized sulphurous acid, it seemed desirable to examine into the possible interdependence of the reactions by carrying them on in succession rather than simultaneously. To this end a quantity of wood was (after extraction with a benzene-alcohol mixture, 2 to 1 by volume) hydrolyzed with hydrochloric acid to provide a material containing 51.02 per cent of cellulose and 28.20 per cent of lignin, based on the original wood, from which the carbohydrates most susceptible to hydrolytic attack had been removed. That material was next submitted to the independent reaction of ionized sulphurous acid. Sulphite cooks, results of which are given in Tables 5, 6, and 7, were run on the hydrolyzed wood.

In the series summarized in Table 5, the wood after hydrolysis with hydrochloric acid was cooked for various lengths of time with sulphite cooking acid of constant composition. Table 6 shows the results obtaned when cooking wood that had been subjected to hydrolysis with a variety of acids of such concentration as to give about the same residue after hydrolysis. Table 7 records the results obtained when cooking wood that had been

pre-hydrolyzed with varying concentrations of hydrochloric acid.

In all these results it may be observed that the lignin removal is a widely varying quantity. If any rule can be formulated from the data, it is that the removal of lignin in the subsequent cooking with sulphite acid is lower the greater the degree of hydrolysis to which the wood is previously subjected. The fact that such a variety of acids are able to bring about this phenomenon of reduced reactivity of the lignin points to a change in the lignin brought about by hydrogen-ion—a view which finds confirmation especially in the results in Table 7, in which it is seen that less lignin is removed from the wood treated with strong acid.

This fact lends itself readily to an explanation of the alteration in wood which produces uncooked chips in the sulphite process or which is associated with the phenomenon of burning or with the impossibility of cooking wood with sulphurous acid

TABLE 5

SULPHITE COOKING OF HDYROLYZED WOOD

Cook No.	Hydrolyzed wood, o. d., grams	Cooking acid analysis: Total SO_2 per cent	Free SO_2 per cent	Comb. SO_2 per cent	Excess SO_2 per cent	Cooking time, hours	Pulp, o. d., grams	Yield pulp basis wood, per cent	Cellulose in pulp per cent	Lignin in pulp per cent	Cellulose basis wood per cent	Cellulose removal: Total per cent	By cooking per cent	Lignin basis wood per cent	Lignin removal by cooking per cent
98	11.6084	2.96	1.99	0.97	1.02	1	11.5670	81.32	61.79	33.86	50.25	14.76	1.51	27.53	2.38
95	11.5910	3.07	2.04	1.03	1.01	3	11.3580	79.95	62.27	33.72	49.79	15.34	2.41	26.96	4.40
94	11.6209	3.02	2.01	1.01	1.00	6	11.1667	78.41	63.10	33.03	49.48	16.06	3.02	25.90	8.16
99	11.5932	3.03	2.05	0.98	1.07	9	10.7641	75.77	64.32	31.11	48.74	17.32	4.47	23.74	15.83
100	11.6564	3.00	1.98	1.02	0.96	12	10.8628	(76.95)	63.19	30.33	(49.58)	(15.90)	(2.82)	(23.07)	(18.19)
101	8.2733	2.97	2.01	0.96	1.05	15	7.3504	72.49	66.89	28.83	48.49	17.74	4.96	20.90	25.89
96	11.1857	3.08	2.07	1.01	1.06	18	9.6635	70.49	68.98	26.10	48.62	17.52	4.70	18.40	34.75
97	11.6677	2.96	1.96	1.00	0.96	21	9.9982	69.92	69.35	25.81	48.49	17.74	4.96	18.05	35.59

Original wood: Cellulose 58.95 per cent; lignin 27.75 per cent.

Hydrolyzed wood: Cellulose, 51.02 per cent; lignin, 28.20 per cent; basis original wood.
Cooking temperature, 120°—0.5° C.; acid, 200 cc.

TABLE 6

SULPHITE COOKING OF WOOD HYDROLYZED WITH VARIOUS ACIDS

Acid: Name	Normality	Wood, o. d. grams	Hydrolysis: Degrees C.	Hours	Hydrolyzed wood, o.d. grams	Residue, per cent	Lignin in Hydrolyzed wood: Found per cent	Basis wood per cent	Cook No.	Hydrolyzed wood, o. d., grams	Cooking acid SO_2: Total per cent	Free per cent	Combined per cent	Excess per cent	Pulp, o. d. grams	Yield pulp basis wood, per cent	Lignin in pulp: Found per cent	Basis wood per cent	Lignin removal: By hydrolyzing and cooking, per cent	By cooking per cent
Sulphuric	0.2040	17.2202	96	6	13.9965	81.28	32.32	26.25	102	9.9253	3.02	2.02	1.00	1.02	7.7798	64.42	21.88	14.10	49.19	46.29
Phosphoric ...	2.963	17.2619	100	6	13.7128	79.44	35.00	27.80	111	10.0064	2.93	1.98	0.95	1.03	8.6211	68.46	28.32	19.52	30.14	29.78
Oxalic	0.7531	16.9382	100	6	13.1896	77.87	33.31	25.94	105	9.7871	3.02	2.00	1.02	0.98	8.2521	65.66	26.42	17.35	37.90	33.11
Tartaric	1.278	16.6660	100	6	14.0570	84.35	31.83	26.85	106	10.0437	3.00	2.00	1.00	1.00	7.2373	60.78	19.95	12.12	56.62	54.86
Acetic	8.333	17.5629	100	12	15.1334	86.17	27.60	23.79	104	11.1212	3.00	1.96	1.04	0.92	8.1327	63.02	20.79	13.04	53.33	45.19
Acetic	(*)	16.9764	135	24	14.4753	85.27	26.40	23.03	103	10.3853	3.05	2.01	1.04	0.97	7.7020	61.24	20.99	13.28	52.47	42.34

(*) The acid used here was a mixture of glacial acetic acid and glycerin (sp. gr. 1.25) in the proportion 60:92 by weight.
Original wood: For sulphuric acid: Cellulose, 58.95 per cent; lignin, 27.75 per cent. For other acids: Cellulose, 59.90 per cent; lignin, 27.94 per cent.
Hydrolyzing acid, 10 cc per 1 g. wood.
Cooking acid, 200 cc.
Temperature, 120° ± 0.5° C.
Time, 18 hours.
Autoclave.

TABLE 7

SULPHITE COOKING AFTER HYDROLYSIS WITH VARIOUS CONCENTRATIONS OF HYDROCHLORIC ACID

HCl normality	Wood, o. d., grams	Hydrolyzed wood, o. d., grams	Residue, per cent	Cellulose in hydrolyzed wood: Found, per cent	Basis wood, per cent	"Sugars" removal per cent	Cellulose removal, per cent	Cook No.	Hydrolyzed wood, o. d. grams	Cooking acid SO_2: Total, per cent	Free, per cent	Comb., per cent	Excess, per cent	Pulp, o. d., grams	Yield pulp basis wood per cent	Cellulose in pulp per cent.	Cellulose basis wood, per cent.	Lignin in pulp, per cent.	Cellulose removal, total, per cent	Lignin basis wood per cent	Lignin removal per cent	Ratio Lignin left after cook, weight loss hydr.	Ratio "Sugars" rem. hydr., lignin left cook
.....	13.6626	.....	....	....	....	....	....	116*	.....	2.99	1.97	1.02	0.95	6.9971	51.21	92.31	6.20	47.27	21.08	3.18	88.62	...	...
0.00496	15.8021	15.1909	96.13	59.78	57.46	4.07	11.76	112	12.5011	2.99	1.99	1.00	0.99	6.8151	52.41	89.39	8.24	46.85	21.79	4.32	84.54	1.99	0.77
0.0101	15.7460	14.7987	93.99	59.66	56.07	6.39	17.93	113	12.1559	2.99	2.02	0.97	1.05	6.8204	52.74	88.71	8.83	46.78	21.90	4.66	83.32	2.78	1.07
0.0250	15.9814	14.2257	89.02	59.84	53.27	11.07	35.77	119	11.6813	2.99	2.01	0.98	1.03	7.5286	57.38	82.69	15.39	47.45	20.78	8.83	68.40	2.88	1.13
0.0500	15.7873	13.4439	85.18	59.77	50.92	14.99	48.03	114	10.9263	3.01	2.03	0.98	1.05	7.6376	59.54	78.55	18.47	46.77	21.92	11.00	60.63	2.65	1.22
0.100	15.8912	12.8552	80.90	60.93	49.29	17.71	69.82	115	10.5060	2.99	1.99	1.00	0.99	8.6166	66.50	....	26.64	....	....	17.71	36.61	3.32	1.10
0.503	16.2947	12.1514	74.57	61.65	45.98	23.24	94.96	117	9.8267	3.02	2.04	0.98	1.06	8.8476	67.14	66.77	31.05	44.83	25.16	20.84	25.41	2.93	1.27

* Sulphite cook made on original, non-hydrolyzed wood.
Original wood: Cellulose 59.90 per cent; lignin 27.94 per cent.
Hydrolyzing acid, 10 cc. per 1 g. wood.
Hydrolysis, 6 hours in a boiling water bath.
Cooking acid, 200 cc.
Temperature, 120° C. ± 0.5° C.
Time, 18 hours.

alone at temperature above 110° C. The apparent discrepancies in the results in Table 3 result from a deficiency of base which permits the alteration in the lignin to become evident. In all the foregoing cases there is present an acid reagent which is capable of producing the alteration in the lignin. It has been observed at this laboratory and also by R. Michael Joffard (5) that a similar effect is produced by alkaline reagents.

There is little in our present knowledge of lignin that offers an explanation of the change that might take place unless it be an observation of Cross and Bevan on the mechanism of the reaction of bisulphites on cinnamic aldehyde, a compound held to be comparable in structure to some elements of lignin. According to them bisulphite attaches itself to the aldehyde group of the acrolein chain of cinnamic aldehyde and upon heating rearranges to the double bond. If the appoint of attack of sulphurous acid on lignin be also an aldehyde or ketone group, and if lignin sulphonic acid, which is held to be the soluble product finally formed, result from a rearrangement, any alteration in the first point of attack would naturally slow up or prevent the reaction. It has also been suggested by Klason (6) that a polymerization or resinification of the lignin can be called upon to explain the alteration.

Considering the interrelation of the reactions that occur in the pulping of wood by the sulphite process, there appears to be none which these results can definitely establish between the two general groups. The removal of carbohydrate material can certainly be accomplished without much lignin removal, but lignin removal without carbohydrate removal has not been accomplished by acid sulphites. The dual reactivity of the sulphurous acid cooking solution rather than any association of the compounds in wood, seems to be responsible for the simultaneity of lignin and carbohydrate removal. Even when effected in the same operation the carbohydrate removal outruns that of the lignin, as was shown in the preceding paper of this series.

TABLE 8
RATIOS OF LIGNIN TO SUGAR IN COOKING LIQUOR

Hägglund's Experiments				Sherrard and Suhm's Experiments	
Time in hr.	Experiment A (not inverted)	Time in hr.	Experiment B (inverted)	Time in hr.	Experiment C (not inverted)
6	1.19	10	0.97	6	2.1
8	2.1	14	1.23	7	1.9
9	2.2	18	1.19	9	2.0
10	2.2			10	2.1
11	2.0			11	2.1
13	1.9			13	2.0
15	1.9				

There is, however, a strong temptation to calculate ratios between carbohydrate material removed and lignin removed. This is done in Table 7, in which the term "sugars" is applied to that part of the carbohydrate material in wood not determined as cellulose by the Cross and Bevan method. Table 8 by Hägglund (7) is a step in the same direction.

Such results are suggestive and should stimulate further inquiry, but the presence of easily hydrolizable carbohydrates and lignin in wood and their simultaneous removal in approximately constant ratio by a single reagent is not, in itself, proof of their existence in combination in the wood. The ratios obtained on liquors from any cook that is carried until near the end may show nothing but that in different specimens of wood the lignin and easily hydrolized carbohydrates exist in a constant ratio, or in other words that the composition of any species of wood is approximately constant.

If ratios of lignin removed to carbohydrate material removed are determined for different stages in the same cook or in a series of cooks under the same conditions but interrupted at different intervals, the results obtained are not constant.

Table 9 from the eighth paper of the series shows the lack of uniformity when the ratio of cellulose removed to lignin removed is calculated, until the cooking approaches completion.

The accumulation of information in this and preceding papers of the series makes possible a more detailed description of the course of the sulphite pulping process than has been attempted heretofore. The removal of carbohydrate material from the wood can be quite definitely attributed to the acid properties of the cooking liquor, and, unfortunately for the hope of increase in yield of pulp, low temperatures and low acidity are sufficient to remove all or nearly all except the stable part of the carbohydrates which approximates cellulose.

The removal of the lignin has been shown to result from the activity of ionized sulphurous acid. Owing to the obscurity which surrounds the structure of lignin one cannot more than speculate as to the mechanism of the reaction.

TABLE 9
ACTION OF SULPHITE COOKING LIQUOR AT 120° C. FOR VARYING LENGTHS OF TIME

Duration of cook hr.	Lignin on basis of oven-dry pulp, per cent	Lignin on basis of oven-dry wood, per cent	Lignin removed on basis of original lignin present, per cent	Cellulose on basis of oven-dry pulp, per cent	Cellulose on basis of oven-dry wood, per cent	Cellulose removed on basis of original cellulose present, per cent	Ratio cellulose removed to lignin removed, per cent
1	27.38	25.42	10.96	58.49	54.58	7.32	2.3
3	27.11	21.78	23.71	62.66	50.35	14.48	2.8
6	23.65	16.54	42.06	70.13	49.04	16.71	2.1
9	17.48	10.95	61.64	77.66	48.66	17.37	1.5
12	10.12	5.67	80.14	85.94	48.15	18.22	1.2
15	6.89	3.66	87.18	88.66	47.16	19.90	1.2
18	5.13	2.66	90.68	91.30	47.29	19.68	1.1
21	3.97	2.02	92.92	91.69	46.70	20.68	1.2

Wood used: White spruce, 40-60 mesh, bensene-alcohol extracted.
Analysis: Cellulose, 58.88 per cent; lignin, 28.55 per cent.
Acid Analysis: Total SO_2, 3.00 per cent; free SO_2, 2.00 per cent; combined SO_2, 1.00 per cent; excess SO_2, 1.00 per cent.

Taking into account the limitations of the apparatus in which the process is carried out commercially, the advantage that might be gained by increase in concentration of ionized sulphurous acid are beyond hope of realization. It is obvious that increase in ionized sulphurous acid means increase in hydrogen-ion and therefore the two main reactions are likely to retain their relations under any conditions of concentration of cooking chemical that might be attained. The introduction of a strong acid during the cook will hasten the removal of carbohydrate material and may so alter the lignin as to retard its removal.

Summary

From the results shown, it can be concluded that:

1. The view of the sulphite pulping process as an acid hydrolysis of wood has been confirmed as far as concerns the removal of carbohydrate material.

2. The removal of lignin is the result of the specific action of ionized sulphurous acid.

3. The simultaneous removal of carbohydrate material and lignin are not mutually dependent, and the results obtained with sulphurous acid and bisulphites depend upon the, at least, dual reactive capacity of the sulphurous acid.

4. The removal of lignin by sulphurous acid and bisulphite is hindered, by preliminary action of acid reagents, to an extent dependent upon the severity of the acid treatment.

[5] Paper, vol. 27, pp. 213-219 (1924).
[6] Vetens kapsaked arkiv for kemi. Bd. 4, n 1, 55 ff.
[7] Papier Fabrikant, vol. 23, no. 25, pp. 399-405 (1925).

Chemistry of the Sulphite Process

X. Easy-Bleaching Pulp

By W. H. Swanson[1] and W. H. Monsson[2]

The cooking of sulphite pulp for easy bleaching should be so performed that the product is readily bleached to a white pulp of maximum strength and yield. It was to establish the cooking conditions which will bring about these results that the experiments reported in this paper were undertaken.

As has been pointed out in previous papers of this series[3], the major factor in the cooking of strong sulphite is the manipulation of temperature. Common experience has shown that this factor is also of greatest effect in making bleachable pulp. It has therefore received the most attention in the present study. The effect of pressure, especially its reduction during the last part of the cook, a procedure performed in mill operation for the purpose of recovery of sulphur dioxide, has also been noted.

Equipment and Materials Used

The digester has been described in a previous paper[4].

Enough white spruce wood to make 80 pounds oven-dry, in the form of chips about five-eighths of an inch in length and containing an average of about 25 per cent moisture, made up the digester charge for each cook.

The acid was made by passing sulphur dioxide gas into a suspension of calcium hydrate in water containing relieved gas from a previous cook. It was so adjusted in strength that in every case it closely approximated 5.50 per cent total SO_2 4.30 per cent free SO_2, and 1.20 per cent combined SO_2.

Experimental Procedure

Cooking Conditions

Sufficient indirect steam was used along with the direct to counteract the direct radiation of the small-sized equipment. The direct steam was so regulated in amount that the dilution effect on the acid would be similar to that obtained in commercial quick-cook practice.

The rate of temperature rise and of the pressure control for each cook are shown graphically in the composite charts, Figs. 1, 2, 3, and 4. The time of temperature rise from room temperature to 110° C. was the same for all cooks, one and one-half hours. It will be noted that four modifications of rates of temperature rise from 110° C. to the maximum temperature have been studied. Pressure was carried to a maximum of 75 pounds, with a "gassing down" period for several of the cooks during which the pressure was reduced at a uniform rate to a minimum of 55 pounds at the blow. The various periods taken for gassing down are shown in the charts.

Yield

Yield determinations were made in the following manner: The pulp from each cook was separated into screened pulp and screenings by means of a diaphragm screen having cuts of .020 of an inch. The entire quantity of screenings, which was small, was oven-dried and weighed. The screened pulp was run over a wet machine, to eliminate a part of the water, and then weighed. Small samples were taken at intervals during the run, and moisture determinations were made upon the combined samples, from which the dry weight of the screened pulp could be calculated for the whole cook. The percentage yield of screened pulp and of screenings, on the basis of the weight of oven-dry wood, were determined from these data and are shown in Table 1.

The purity of the unbleached pulps was determined by analyses for lignin and for cellulose. Lignin was determined by use of 72 per cent sulphuric acid in the usual manner. Schorger's modification of Cross and Bevan's chlorination method was used for cellulose isolation. The values resulting from these analyses are included in Table 1.

Bleachability

Bleachability tests were made by treating 12-in. oven-dry samples of each pulp, in water suspension at about 2 per cent consistence, with varying percentages of bleaching powder in solution. The bleaching was carried on at 35° C., with continuous stirring, until all chemical had been exhausted. The bleached samples were washed and made into hand sheets, which were dried and compared with a similar sheet of a standard whiteness. By this comparison the percentage of bleach powder required to develop the standard white was estimated. Results of the bleachability tests are included in Table 1.

TABLE 1
YIELDS AND PROPERTIES OF THE UNBLEACHED PULPS

Cook No.	Temperature and pressure	Yield of oven-dry pulp: Total pulp Per cent	Yield of oven-dry pulp: Screened pulp Per cent	Yield of oven-dry pulp: Screenings Per cent	Requirement of 35% bleach powder Per cent	Pulp analysis: C. and B. Cellulose Per cent	Pulp analysis: Lignin Per cent	Bursting strength in points per pound per ream of 24x36x500, when beaten in the ball mill for: 20 min.	40 min.	60 min.	80 min.
3130-I	Fig. 1	50.2	48.2	2.0	22	94.6	4.2	0.86	1.11	1.14	1.17
3128-I	Fig. 1	48.5	46.1	2.4	17	95.8	3.2	0.75	0.99	1.00	1.03
3122-I	Fig. 1	47.5	47.2	0.3	12	96.9	2.6	0.50	0.72	0.81	0.90
3121-I	Fig. 1	47.0	46.0	1.0	12	97.0	2.3	0.52	0.73	0.81	0.88
3120-I	Fig. 1	47.9	46.6	1.3	20	95.3	3.4	0.80	0.99	1.05	1.06
3123-I	Fig. 3	43.1	42.1	1.0	12	97.0	2.8	0.60	0.80	0.93	0.88
3126-I	Fig. 3	43.3	41.5	1.8	12	96.8	2.5	0.54	0.73	0.89	0.87
3127-I	Fig. 3	47.4	45.2	2.2	20	95.8	3.5	0.61	0.88	0.97	0.95
3131-I	Fig. 4	48.5	47.8	0.7	10	98.0	1.8	0.66	0.87	0.95	0.91
3129-I	Fig. 4	50.1	49.1	1.0	27	93.9	4.5	0.92	1.16	1.19	1.17
3124-I	Fig. 2	48.2	47.4	0.8	12	97.0	2.3	0.64	0.91	1.03	1.03
3125-I	Fig. 2	49.0	48.5	0.5	12	97.1	2.5	0.63	0.87	1.01	1.03

Bleaching Losses

It was thought desirable to know the loss in weight of a few of the pulps incident to the solvent action of bleach liquor. Three pulps were chosen for examination, two of which were known to bleach readily and the third not so easily. Samples of each were bleached as before described, the amount of bleach powder being used which the preliminary tests had shown to be necessary to produce a standard white. The samples were then thoroughly washed, oven-dried, and weighed. The weight losses were calculated in percentages of weight of oven-dry unbleached pulp, and are included in Table 2.

Strength of Bleached and Unbleached Pulps

While over-bleaching is known to have a detrimental effect upon strength, past knowledge has not been sufficiently definite as to the effect of normal bleaching, especially when the pulps have been prepared under a variety of cooking conditions. Several tests were therefore included in the study to determine to what degree bleaching affected strength. The three pulps of which samples had been tested for loss on bleaching, together with one other, furnished material for these tests. They were bleached in 500-g. quantities. The jar of a ball mill with the pebbles removed was used as a bleacher. The pulp, at a 7 per cent consistence in water, was heated to 350° C. and placed in the jar. After addition of bleach liquor the jar was closed and the mill rotated until bleaching was completed, which required about 6 hours. The three pulps previously tested were treated with the amounts of bleach solution known to be required to bring out a standard white. The fourth sample and a 500-g. portion of one

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[3] Paper Trade Journal, April 10, 1924, Tech. Ass'n. Papers VII (1924).
[4] Paper Trade Journal, April 13, 1922. Tech. Assn. Papers V (1922).

of the first three pulps were treated in the above manner, except that excess of bleach solution was added in order to bring about an overbleached condition. After bleaching, all the pulps were washed and prepared by the usual methods of the Forest Products Laboratory for strength tests. The bursting strength alone was determined, as practice has shown it to be the most convenient and consistent of the various strength tests.

Copper numbers were determined for the bleached pulps by the method of Staud and Gray[8] as an indication of the degree of overbleaching.

The analytical data and bursting strength values for the pulps before and after the treatment described above are given in Table 2.

TABLE 2
PROPERTIES OF BLEACHED PULPS TOGETHER WITH SOME OF THE PROPERTIES OF THE PULPS IN THE UNBLEACHED STATE

Cook No.	Condition of pulp	Bleach, per cent	Copper No.	Bursting strength in points per pound per ream of 24 x 36 x 500 when beaten in the ball mill for 20 min.	40 min.	60 min.	80 min.	Chemical loss on bleaching, per cent	Yield of screened pulp after bleaching, per cent
3126-I	Unbleached	0	1.76	0.54	0.73	0.89	0.87		
	Bleached	12	1.93	0.54	0.86	0.94	0.90	1.9	40.8
3123-I	Unbleached	0	1.63	0.60	0.80	0.93	0.88		
	Overbleached	14	3.62	0.57	0.74	0.75	0.63		
3130-I	Unbleached	0	1.76	0.86	1.11	1.14	1.17		
	Bleached	22	2.02	0.87	1.10	1.17	1.06	5.8	45.4
3131-I	Unbleached	0	1.73	0.66	0.87	0.95	0.93		
	1. Bleached	10	2.04	0.56	0.85	0.93	0.90	1.9	46.9
	2. Overbleached	12	2.18	0.80	0.86	0.88	0.78		

Differentiation between the unbleached pulps with regard to papermaking strength was made by means of bursting strength tests on samples of each pulp prepared by the standard method of the laboratory. The results are shown in Table 1.

Discussion of Results

Effect of rate of temperature rise

Considering first the cooks finished at a maximum temperature of 148° C., there were four cooks, Nos. 3130-I, 3121-I, 3123-I, and 3126-I, in which the pressure was maintained at 75 pounds until the end. In Cook's 3130-I and 3121-I (See Fig 1) the temperature was brought up at a uniform rate to the maximum temperature in 8½ hours. Cook 3130-I was blown at that point and produced a strong pulp, not readily bleached, with a high yield, as can be seen from Table 1. Continuing the cook for 1½ hours longer at the maximum temperature, as was done for Cook 3121-I, produced a readily bleached pulp which, though not as strong as the other, was still of commercial value in respect to strength. Although the numerical values of the bursting strength in this case are not high, it will be noted that even after 80 minutes' beating the pulp had not reached its maximum strength. This is a desirable feature, as it indicates that the pulp would stand considerable abuse in beating without material injury.

Cooks 3123-I and 3126-I were duplicates, as can be seen from Fig. 3. In both of them the temperature was brought rapidly to a rather high degree and then slowly increased to the maximum. The time of cooking, as compared with that of Cook 3121-I was considerably shortened. The effect of premature high temperatures is strikingly shown in both cooks by the yield and strength, both of which are low. Not only so, but the maximum strength has been passed at 80 minutes' beating, showing that the pulp would not withstand much abuse, and would never be tough. Only in the property of bleachability does a pulp produced in this manner compare favorably with one of the type represented by Cook 3121-I.

Incidentally, Cooks 3123-I and 3126-I illustrate the accuracy with which pulps can be reproduced by careful control of the cooking conditions. The acid, rate of temperature rise, and maximum pressure were the same, and there was only 15 minutes difference in time at the end of the cook. The resulting pulps were very similar in yield and in chemical and physical properties, as can be seen by comparison of the data in Table 1.

Cooks 3129-I and 3131-I were also finished at a maximum temperature of 148°. Referring to Fig. 4, it will be noted that the rate of temperature increase from 110° C. was quite slow at first and then increasingly rapid until 148° C. had been reached. From that point the temperature was held constant. In both cooks the pressure was reduced to 55 pounds at the blow. Cook 3129-I finished in ten hours, produced a good pulp but required a rather high bleach requirement. Extending the time by half an hour was sufficient to produce a pulp of the desired bleachability with a total yield higher than any previously noted in this series, and of very good strength.

Considering, then, the effect of the three general types of temperature rise on the pulps produced, the inference is clear that the more rapidly the temperature is increased from 110° C. to any given maximum the more undesirable will be the pulp.

Effect of Reducing Pressure

Pressure reduction lowers the free SO_2 content of the cooking and, in consequence, the concentration of the sulphurous acid. The latter factor is secondary only to temperature in its effect on the rate of cooking. If pressure reduction is started before the pulp has reached a relatively high degree of purity, the vigor of the cooking reaction during the later stages of the cook will be reduced to such an extent that the product will be noticeably raw. This fact is illustrated by a comparison of Cooks 3120-I and 3121-I. They were similar except that the pressure in the first was reduced after the third hour to a minimum of 60 pounds at the blow. The rate of pressure reduction is shown in Fig. 1. A markedly larger yield and strength value, as well as greater bleach requirement, resulted. Cook 3127-I, which was similar to cooks 3123-I and 3126-I except for a 1-½ hour pressure reduction period, shows a like increase of yield and bleach requirement.

If however, the purification of the pulp be fairly complete before starting the reduction of pressure, the latter has little effect on either yield or quality. This is shown by a comparison of Cooks 3122-I and 3121-I. In Cook 3122-I the period of pressure reduction, which was the more comparable with that of commercial practice, resulted in a yield of pulp slightly higher than in Cook 3121-I, but no material effect on the bleachability or strength was seen. Cooks 3125-I and 3124-I (See Fig. 2) when compared in the same way, show the same result.

Effect of Completing Cook at Low Maximum Temperature

The effect of completing the cook at a relatively low maximum temperature is demonstrated by Cooks 3124-I and 3125-I. The rate of temperature rise and the pressure manipulation are shown in Fig. 2. The yields, bleachability and strengths of the pulps are very good. Both cooks produced pulps superior to any of the others. The cooking time was longer, but where time is not a major consideration it is certainly most desirable to use a temperature rise leading to a low maximum.

Effect of Bleaching on the Strength of Pulps

The effect of bleaching on the strength of pulp is shown in Table 2. The pulp samples from Cooks 3126-I, 3130-I, and 3131-I, which were properly bleached, show very little change in strength after bleaching. The only notable difference is in a slightly more rapid increase in strength in the beater. The small increase in copper number for these pulps shows that they have suffered no appreciable oxidation from overbleaching.

With samples from Cooks 3123-I and 3131-I, which were overbleached, the strength values were lower, especially after 60 and 80 minutes' beating. With pulp No. 3131-I the overbleaching was not so severe as with No. 3123-I, and the strength was affected to a considerably less degree.

Loss in Weight on Bleaching

As shown in Table 2, both pulps 3126-I and 3131-I, which were

[8] Ind. Eng. Chem. vol. 17, No. 7, July, 1925.

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quite pure and required only a small amount of solution, suffered only a small loss in weight on bleaching. But pulp 3130-I, bleaching rather hard, suffered a greater weight loss, as might be expected. The extent of the loss in weight on proper bleaching, then, appears to depend on the original purity of the pulp.

Summary

The experiments outlined in this paper have shown that in the cooking of spruce wood for easy-bleaching sulphite pulp the temperature rise to any given maximum should be carried on at a rate sufficiently slow to insure maximum removal of the lignin at the lowest possible temperature consistent with the time available for the cooking. Bringing the temperature up through the cooking range, above 110° C., too rapidly, to compensate for a shorter cooking time, reduces the yield and strength of the pulp. A slower rate of temperature rise, although a longer time for completion of the cook is required, increases the yield and improves the quality of the pulp.

Lowering the maximum temperature at which the cook is completed lengthens the time required but again increases the yield and improves the quality of the pulp.

The reduction of pressure during the later stages of the cook, for the purpose of sulphur dioxide recovery, serves to increase the yield of desirable pulp slightly, provided the pulp has reached a high degree of purification before the pressure is reduced. Pressure reduction at too early a point slows up the rate of cooking and produces a raw pulp. To effect purification under such treatment requires long cooking or cooking at high temperatures and results in reduction in yield by hydrolysis of the cellulose.

Correctly cooked pulps do not suffer loss in strength when properly bleached. Overbleaching is detrimental to strength, particularly in the case of pulps cooked with too rapid a temperature rise.

The chemical loss in weight of pulp on bleaching is dependent on the bleachability alone. The harder the pulp bleaches the greater will be this loss.

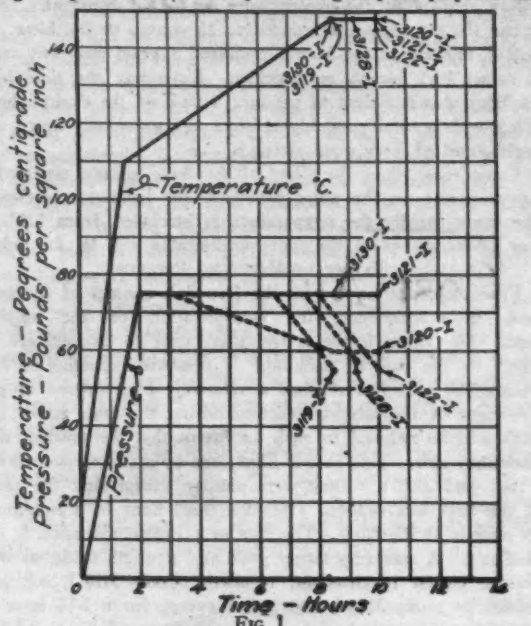

FIG. 1

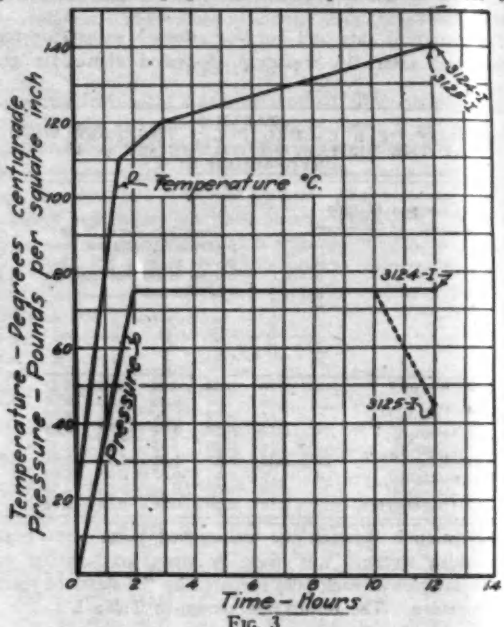

FIG. 3

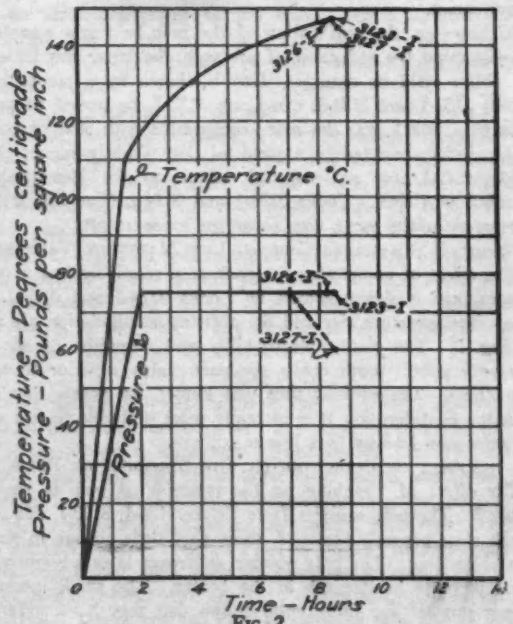

FIG. 2

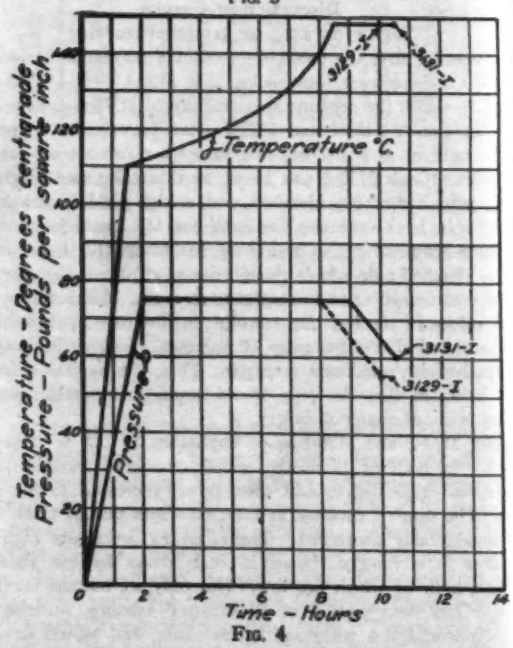

FIG. 4

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A Neglected Phase of Cost Accounting*

By J. W. Robinson, C. A., Late Gen. Sec., Thomas A. Edison Industries

Cost accounting deals with the cost of materials, cost of direct labor—that is, labor applied directly to the product—and overhead expenses. Getting the cost of material placed where it belongs is, in the main, fairly simple, and so is the charging of what is termed "direct" or "productive" labor to the cost of the product. It is in the problem of properly distributing overhead expense, including "indirect" or "unproductive" labor, that accountants find their difficulties.

True of Both Manufacturing and Selling

This is true not only of manufacturing plants, but also of selling businesses. However, indirect labor usually receives the accountant's attention only in connection with the general problem of distributing overhead expense as a whole.

Close study is made of the cost of direct labor per unit manufactured or sold and its relation to cost and selling price, its variations between periods and between individual workers being used as a yardstick to measure efficiency. The cost of indirect labor is buried in the item of general overhead expense, and, though compared as a total, or perhaps in sub-totals, with its cost in previous periods, and in its relation to volume of production or sales, usually escapes searching analysis.

Production Departments Know Outputs

The manager of a manufacturing plant, or of selling force knows exactly which "productive" departments, and even which individual employees, are helping to produce profits, and which are not. These managers can quickly eliminate the drones, or can take steps to correct conditions which may be the cause of misdirected and unprofitable work. But how seldom is any attempt made to keep account of the value of the work done by "indirect" or "unproductive" employees, and its relation to the wages and salaries paid, and incidental expenses involved.

With certain exceptions, such as typists paid on a lineage or per letter basis, inspectors paid on quantities handled, etc., "unproductive" workers cannot be placed on a piece work or quantity production basis, nor can commissions be paid as in the case of salespeople, but there is no reason for neglecting all attempt to ascertain the value received in return for the wages and salaries paid.

It is the writer's opinion, based on observations made in the course of public accounting, and as an executive of large corporations, that there lies concealed in the items of "indirect" labor, clerical wages, and executive salaries, a vast amount of unsuspected waste.

This waste is probably greater in offices than inside the walls of factories, or on the floors of selling establishments. Factory superintendents, foremen, inspectors, stockmen and timekeepers, and head salesmen, store superintendents, section managers, and department cashiers, are usually very busy people, whose working hours are every bit as productive as those of the "direct" workers. But step out of the factory, or off the selling floor, and you are confronted, in almost every office you enter, with mis-directed effort, haphazard methods, moss-grown routine and work done at a cost entirely disproportionate to its actual value.

Cost Accounting for Office Work

Cost accounting has scarcely entered the office, and has not dared to dream of entering the sacred precincts of the executive departments.

In how many offices is known the cost of writing a letter, sending out a bill, entering a regular transaction on the books, or holding a conference?. Yet how large these expenses are, and how many units of output must be produced in the plant to pay for each one of these office operations. Some attempts have been made to regulate office costs, but usually they have covered only such insignificant items as supplies—paper, pencils, typewriter ribbons, etc. Labor, the most expensive item, has been utterly disregarded.

It is not hard to get at these costs—much simpler, in fact, than to arrive at the cost of a manufactured unit, or of effecting a sale. Probably the average office worker, from clerk to executive, puts in less than two thousand working hours a year. Salaries are more or less fixed, office expenses are known, and arrival at hourly rates is easy. It is not difficult to count the number of letters sent out, or transactions handled, nor to time the beginning and end of those weekly, or perhaps daily, conferences, committee meetings, and the like.

What Do Conferences Cost?

If conferences were "costed" there would be less of them, especially if the cost were carefully weighed against the actual results attained.

If the letters personally dictated by high-priced executives, taken down by stenographers (instead of being dictated to an Ediphone), typed, reread and signed, were costed, much wordy and unnecessary correspondence would be cut out, and a great proportion of the routine letters which many executives now insist on personally dictating would be left to subordinates to handle.

If the cost of work done by executives, junior executives, accountants, clerks, stenographers, and "indirect" workers generally, were figured as closely as is that done by "direct" workers, there would be an immediate and drastic reduction in the army of "white collar workers."

* From "Management and Administration."

Profit-Making Factory Equipment*

By Col. B. A. Franklin, Vice-Pres., Strathmore Paper Co.

In this age of invention machinery has become the most common thing in industry. Once possessed, its very solidity and dependability become a danger. It is the first and most important item that receives real attention when the establishment of the industrial unit is considered, because it is the first essential without which existence is impossible. Once obtained and set to work, it becomes not infrequently the last consideration.

This is, of course, human nature. The industrial executive buys the best machinery and equipment that, at the time of need, he thinks he can afford. It appears solid, controllable, fixed, long-lived, and expensive. It has solved the main question of production, and, presumably, with comparative permanence. The usual, ordinary, and the simplest thing to do is to get the best results possible from it, and to continue that course more or less indefinitely over a long period of time. If, perchance, the pressure of daily problems occasionally relaxes sufficiently to permit consideration of these performances, the cost of change or replacement frequently seems so great as to sidetrack action.

The truth of the matter is that the possession of machinery produces an insidious effect. The human mind likes to see it work. The executive mind desires to see it produce, to earn on its investment; hates to see it discarded, as long as it is able to do what it was originally designed to do; feels that to replace it before replacement was expected, or before it has outlived its usefulness, is to waste its investment.

As a result, especially in the older industrial centers, there are many manufacturing units, operating casually with ancient outfits, unable to meet the competition of newer districts or of newer units, struggling along without growth because of high costs and restricted profits, or frequently with no profits. The writer has in mind two plants, recently fallen into new hands, once profitable and reputable, still reasonably solvent but, despite the introduction of modern methods, struggling against the handicap of old machinery and equipment. Eventually they will be forced to choose between rehabilitation or cessation. And these two plants are representative, at least in degree, of very many industrial units.

The Machine-Hour Measure

No industrial executive can afford to revamp his machinery and equipment at will, and it would be often a ruinous process if he did. But there is a formula, the constant operation of which ought to be a part of industrial unit practice.

Machinery and equipment, especially the former, wear out, but the results of wear and tear can be so largely offset by care, repair, and replacement as to be economically distributed over a long period. The greatest destroyer of the comparative value and efficiency of machinery is obsolescence—the result of the invention of new machinery which will accomplish much greater volume in a given period of operation.

In this advancing age of machinery, in the last analysis, the vital problem of production is not always, nor indeed mostly, so much what can be obtained per man-hour, as what can be obtained per machine-hour, since that is the limiting factor of the operator, and may largely reduce the product the operator is capable of making. As to equipment, the output of the combination of machine and operator depends not a little on the equipment supplied.

If to these considerations is added the fact that the tendencies, both of competition and the buyers' demand, are for lower prices, it will be evident that the question of machinery and equipment is a constant and extremely important one in the profitable life of the industrial unit.

In the modern and advancing competition, the maximum production he can obtain per machine-hour from the machines he has is a vital matter to the industrial executive. It is the internal daily problem. But he must be alert to discover what the machine-hour production would be if he possessed the latest machinery designed for the work—machinery which is or will be possessed by some of his competitors. This is his external problem. It demands that he keep in touch with his machinery market, which is no difficult problem, for, with very little encouragement, this market will camp on his doorstep.

Maximum Machine-Hour Production

To solve his internal problem, the industrial executive can, with the aid of his cost system, work up his own formula. In working up this formula, the executive has two aids: The first is the fact that the cost per machine-hour involves, not only the labor cost, but the expense rate per machine-hour, and it most frequently happens that the latter is the larger item of the two. Through a proper cost system it is not difficult to figure what an annual saving would amount to in reduction of the total cost of the operation with the latest designed machine. With this saving in mind, and the net cost of replacement, decision may rest on the calculation as to how long the saving must operate to replace the added investment and begin to turn back to profits its whole amount or otherwise, to place the unit on a stronger competitive basis. Certainly, machinery must from time to time be replaced. Such a formula, constantly considered, is the scientific basis, as well as the common-sense basis for its replacement.

The second aid in the solution of this problem lies in depreciation. The wise executive appreciates the necessity from the accounting point of view of a proper allowance for depreciation, both from wear and tear, and from obsolescence. The tax laws recognize these depreciations of value. Too often, however, depreciation is considered as merely an accounting gesture. Yet depreciation from the common-sense, business point of view ought not merely to be set up on the books as a reserve to cover the definite losses which occur, and to ameliorate taxation, but also to be put into the actual cost of manufacture so as to make a complete basis of cost for price-fixing. This must be done in order to obtain the return of this loss.

Depreciation has, however, a more important function. It is a definite calculation of the amount of waste of capital invested, and the main purpose of setting it aside is to create a reserve to be spent in new machinery to replace the calculated waste. In practice, therefore, depreciation reserve is the pool into which the executive dips to obtain funds withheld actually from the sale of production, to keep his investment in machinery and equipment up to its true normal value and efficiency. Otherwise depreciation has no effective operation.

A Formula for Machine Replacement

With this depreciation in mind, the formula for machinery replacement becomes still more effective from the possible and practical point of view. Its proper operation in the past, with common sense and judgment, would place many industrial units today in a much happier operating and profit-making condition. Its proper operation in the future, with both foreign and newer locality competition, will be the salvation of older industrial localities. Its operation is entirely in the line of scientific management.

Such a formula might be stated mathematically as follows:

$$\frac{\left(\begin{matrix}\text{Cost of}\\ \text{new machine}\end{matrix}\right)-\left(\begin{matrix}\text{Salvage of}\\ \text{old machine}\end{matrix}\right)-\left(\begin{matrix}\text{Accumulated depreciation}\\ \text{on old machine}\end{matrix}\right)}{\left[\frac{\left(\begin{matrix}\text{Hourly cost of}\\ \text{old machine}^{2}\end{matrix}\right)}{\left(\begin{matrix}\text{Hourly production}\\ \text{of old machine}\end{matrix}\right)}-\frac{\left(\begin{matrix}\text{Hourly cost of}\\ \text{new machine}\end{matrix}\right)}{\left(\begin{matrix}\text{Hourly production}\\ \text{of new machine}\end{matrix}\right)}\right]\times\text{Annual production}}$$

= Years required for new machine to return its additional investment.

[2] From Management and Administration.

In a given case, the problem might work out as follows:

$$\frac{\$6000 - \$1000 - \$3000}{\left(\frac{\$0.80 + 2.50}{20} - \frac{\$0.80 + 2.20}{12}\right) \times 25{,}000} = \frac{\$2000}{\$2125} = \text{Something less than one year, or, with a correction for interest, say one year.}$$

In this formula a higher expense rate is allowed for new machinery.

This may look like a very favorable case, but there are very many cases like it. At any rate, each case so worked out will give the executive a basis for judgment, and in many cases there are still two points of possible further vantage, i. e., a greater annual production to sell, and the putting of the unit on a better competitive basis.

Elements in Lowering Machine Production Cost

When improvements are made in existing machinery to increase production, or the same result is effected through the substitution of newer machinery, or the addition of equipment, then it is the fair thing to change rates and bonuses for production to at least the extent to which the change is responsible, if extra effort of the operator is not created thereby.

Machinery production cost cannot, however, be considered merely as to the single machine, for complete production is almost invariably a matter of group machinery operation. The cost, therefore, of this production, if considered from the economic point of view, as of course it must be, involves two important elements. The first of these is straight-line and continuous production. If the best value is to be obtained from one machine, it is important that the raw or semi-finished material be promptly fed to it or taken away from it. When, therefore, the grouping of machines to bring about finished production is considered, both the questions of readiness of material and transportation become important. A chart of the movement of material in many industrial units frequently presents a picture of tangled threads, involving considerable extra labor cost, whereas, as nearly as possible, a single line should represent this movement of material.

A second most important element involves the equipment of the industrial unit both as to the machines themselves and transportation to, between, and from them. A proper scientific management theory involves the utilization of the most skilled labor to the maximum, aiding it in less skilled work by less skilled labor. A second scientific management theory involves the most economic results with the most helpful equipment. Transportation should be arranged not merely to make it as prompt as possible but most economical and independent of labor cost. Perhaps an outstanding example of such a solution is the Ford method of assembling. Here again a proper cost system may quickly operate with data and calculation to develop a formula, and to show savings to be made by installation of equipment both to facilitate production and cheapen transportation. When this is done, a proper balance between cost of equipment and its liquidation by savings may be made with consequent decision.

These things are, of course, reasonably well known as to their theory, but their practice is too often left to chance inspiration and suggestion instead of careful and competent survey. There is in mind one case in a well-managed company, where only recently, after a number of years' operation, it was discovered that the introduction of simple, quick handling equipment cut the operation cost in half. There are many such conditions which would develop from a practical understanding or comprehension that, in these days of shorter hours and increasing labor cost, the great need is for labor-saving machinery and equipment.

Maintenance of Machinery

It seems sufficiently obvious that, through the very purpose of machinery and equipment to produce with accuracy and dispatch, there should be instituted in every industrial unit a definite routine of care and cleanliness, of lubrication and watchfulness of bearings and wearing surfaces. Without a routine method and a definite responsibility placed upon a trained man, the usual carelessness of even skilled operators, whose main aim is production, brings about, in time, the condition that machinery operates more slowly and less accurately, thus producing lower quality at higher cost, and it will eventually be found that the effective machine life is shorter. The industrial executive, in the interest of economy and preservation of his investment, should give this point definite consideration and develop a system of trained care and supervision, the cost of which will be found to be well covered in the resulting eventual economy.

Especially should such a system take into account the question of repair. It very often happens that a careful inspection of machinery and equipment will discover repair requirements even before the necessity of shut-down occurs, so that, with such forewarning, repair may be made at noon times or in natural shut-down periods without diminution of production. It will also be discovered frequently that part replacement instead of shop-patch often not only is more economical in the particular repair, but keeps the machinery and equipment in a much more up-to-date condition, and prolongs its natural life; for it must not be forgotten that even with obsolescence there is much machinery that has a very long natural life.

It is also true, especially with large machinery and equipment, that it may often be brought up to the most modern requirements by the addition of newly invented and devised attachments which, without complete replacement, add to its efficiency.

When machinery and equipment are considered as a unit for promotion, an important problem that presents itself is the balancing of it, i. e., the establishment of the group in such a combination that the flowing production will keep them all busy. This involves a study of all operations and the hourly production of each machine, so that there shall be a sufficient number of the slower ones to keep the speedier ones at maximum production. This, of course, is not always possible, in which case it becomes important so to arrange the combination as to keep busy, if possible, the originating and the expensive machinery. In this problem lies a definite cost reduction factor in many units.

The standardization of the operation of machinery and equipment is a very large factor in its maximum economic use. A machine is designated and built to be operated with certain equipment, at certain speeds, with certain tools, and to produce certain production under best conditions. These necessities and possibilities are often either forgotten in time or are unheeded. Each machine ought to be definitely, and in unity, standardized as to these things, and the cost department furnished with the standard hourly production as a basis for reporting continuous departure from standard, and as a basis for a shop return to them. There is no better method of keeping up the maximum use of machinery definitely bought for a given balanced purpose, but left to a varying and uninformed or careless group, than such a method of standardization of possible and practical use.

In this matter of standardization of course, there enters the question of toolroom, of tool supply, of spare parts and, especially, of all necessary arrangements to keep the machinery operating to the maximum.

There is, of course, also a valuable standardization in any one unit, of type of machines and in type of operation. The individual executive, with the outlook to the future, will of course see that his machinery is of the best type for the purpose, and is operated, whether under the group or on the unit plan, in the most economical manner.

It is, of course, needless to point out that it is both humane and economical to arrange with the utmost care for safety both in the placing of machinery to allow ample room for movement about it, and also for protection against moving parts.

When all machinery is utilized steadily, the power load theoretically ought to be steady, although statistics show that it is not. Where certain intermediary machinery cannot be run full, frequently a study of the daily power loading may show that the intermittently operating machinery may be most economically op-

erated between certain hours, assuming that the proper labor conditions can be met.

Power machinery is, of course, an important element in the operation of any plant, even when the power is bought and not manufactured. The best experience with this element of machinery shows it pays definitely to measure its efficiency from all angles, and that a bonus system for the attainment constantly of standard production of power is advantageous.

Place of Machinery in the Industrial Unit

In this modern age of industry, machinery and equipment, with organization, come near to being the most important elements in the industrial unit. Nothing will so insure future success—and the industrial executive must always be concerned with future success—as proper attention to machinery and equipment. While organization may be the key to present success, undoubtedly machinery and its proper consideration are the keys to future success.

The industrial executive who lets his machinery become comparatively inefficient, either through careless operation or unreasonable obsolescence (for even the latest model quickly becomes a little out of date), sets for his industrial unit a definite handicap often not to be overcome by the most efficient labor operation.

The standard gage by which he must measure machinery efficiency is not the physical condition of the machine, important as that is, nor the production from it of approximately 100 per cent of its standard output; but the gage must be the production of the latest and best machine on the market operating in the hands of competitors.

Under these conditions, the industrial executive who desires to keep his unit to the forefront must learn to estimate his production in terms of machine-hour cost and to measure his relative standing in his market by the lowest machine-hour cost producible on the latest machines. While it is true that care and arrangement of his machines, and the fact that his competitors are seldon completely equipped with the latest machinery, will permit him still to compete with profit, this condition cannot be expected to last over a long period, and a definite long-term plan should be made to meet any possible competition.

An industrial unit need not grow old, but its youth and vigor can only be maintained by watchfulness and the common-sense infusion, by calculated plan, of modern machinery and equipment.

Laurentide First in Safety Contest

The Ontario Pulp and Paper Maker's Safety Association Class "A" flag and shield for the best accident record among the larger Pulp and Paper Mills in the province of Ontario for the year 1924, was awarded to The Spanish River, Sault Ste. Marie Mill.

The Laurentide Company in congratulating and commenting upon the Soo Mill's achievement through the medium of its house organ, pointed out that the Laurentide Company, apart from smashing its own best previous accident record, had also the distinction, for that year, of showing a lesser severity rate than the Spanish River, Soo Mill. This led to some correspondence between R. M. Olzendam, secretary, Department of Industrial Relations, Spanish River Mills, and J. H. Turner, Safety Inspector, Laurentide Company, culminating in a challenge from Mr. Olzendam for a three months' friendly competition for the period July 1 to September 30, 1925, which was accepted.

Rules were drawn up and an interchange of accident reports and the steps taken to prevent a recurrence agreed upon. A. P. Costigane, Secretary and Engineer, of the Ontario Pulp & Paper Makers' Safety Association, Toronto, courteously consenting to act as judge.

The main idea behind the competition, was an endeavor to lessen the number of the preventable kind of accidents and create a definite improvement upon the accident situation in the mills in general. It was also hoped that this innovation of an inter provincial safety competition would have far reaching effects and, perhaps, be the means of getting others to emulate the competition and thus foster a closer safety friendship between the Pulp and Paper Mills in Ontario and Quebec. Laurentide was the winner of this Competition.

It was immediately arranged to hold a second contest to run during the three succeeding months, October, November and December. Again Laurentide was the victor, this time by a very decided margin. The judge's findings are as follows:

1st Period, July 1 to September 30, inclusive

Laurentide Co., Ltd.		Spanish River P. & P. Co., Ltd. Soo Mill	
Number of working days	74	Number of working days	76
Total hours worked	700,515	Total hours worked	479,306
Number of full time workers	947	Number of full time workers	631
Number of lost time accidents	6	Number of lost time accidents	12
Total days lost	87	Total days lost	103
Days lost per full time worker	.091	Days lost per full time worker	.163

2nd Period, October 1 to December 31, inclusive

Laurentide Co., Ltd		Spanish River P. & P. Co., Ltd. Soo Mill	
Number of working days	83.25	Number of working days	78
Total hours worked	728,622	Total hours worked	490,307
Number of full time workers	876	Number of full time workers	629
Number of lost time accidents	10	Number of lost time accidents	18
Total days lost	127	Total days lost	255
Days lost per full time worker	.145	Days lost per full time worker	.405

"The above figures show the Laurentide Company won both competitions and I have pleasure in hereby awarding that Company the contest in both instances.

"An analysis of the above figures shows that the Laurentide Company could in the first contest have incurred lost time up to 154 days without losing the contest. During the second period this Company could have incurred lost time up to 354 days without losing.

"It has been a great pleasure acting as judge in these contests and I have pleasure in congratulating the employees of both companies on the sportsmanship shown throughout the contests, and I hope these contests will be the forerunners of many such in Canada.

"A. P. COSTIGANE, Judge of Contests."

Mr. Olzendam in congratulating Laurentide upon its dual victory, states that the Spanish River enjoyed the contests and have profited much by them. With the Laurentide employees, the progress of the contests was keenly followed with a growing interest as the men realized they themselves were the players in the game and that there would be a definite gain coming to them by winning. To make this possible they realized that the responsibility of exercising care while at work was invested in them individually and collectively.

A comparison with the corresponding period of the previous year, the banner accident year, shows a big reduction in both the frequency and severity of the lost time accidents during the competitive period. The results obtained proving to be much more beneficial to all concerned than anticipated.

Washington Paper Co. to Build Power Plant

PORTLAND, Ore., February 25, 1926.—The Washington Pulp and Paper Company, Port Angeles, Wash., has announced plans for building a hydro-electric plant at Glines Canyon on the Elwaha River, capable of developing 10,000 horse power, thereby doubling the capacity of this news print mill.

The present capacity of the mill is 140 tons every 24 hours and it is expected the new improvement will increase the output to at least 260 tons in the same period.

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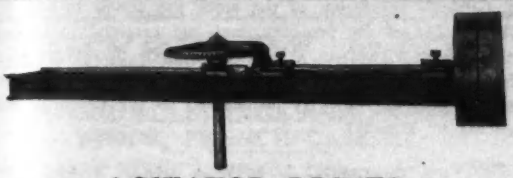
Orr Endless Felts can now be obtained up to 86 feet in length.

With our enlarged new equipment we can now furnish Paper Manufacturers with endless felts up to 86 feet in length.

Paper Manufacturers who carefully check manufacturing costs, and also strive to produce more and better paper at a lower cost per ton prefer the unvarying quality and long service of ORR felts. A trial of them will bring about a preference of them that will be lasting.

THE ORR FELT & BLANKET COMPANY, Piqua, Ohio



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Patent BALL VALVE Hydrant
Stock Circulating Systems and
other Paper Mill Specialties
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MULTIPLE PLY
ENGLISH WEAVE
In Two, Three, Four, Five and Six Ply, 60 inches to 176 inches in width.
BY ACTUAL TEST this felt will dry 33 per cent more paper, with ABSOLUTELY NO FELT MARKS IN THE PAPER.
TRIUNE
THREE PLY FELT for other paper
FITCHBURG DUCK MILLS
FITCHBURG - MASSACHUSETTS

Oregon Pulp & Paper Co. Meets

PORTLAND, Ore., March 1, 1926.—The first meeting of the board of directors of the Oregon Pulp and Paper Company which has been held since F. W. Leadbetter came into control of the company, was held recently. B. L. Steves, Salem, was named vice-president of the company at the stock holders meeting and George Putnam, publisher of the *Capital-Journal,* was named as a new director to succeed E. S. Collins who sold his stock to Mr. Leadbetter.

Expansion of the manufacturing plant will take place, probably to the extent of $450,000 during the present year. Manager C. F. Beyerel is working on details for the proposed extension which will include a building for a large new machine.

Mr. Leadbetter has announced that the expansion program can go forth without reducing the annual dividends below six per cent.

Superintendents of the mills owned and controlled by the Kimberly-Clark Company held their annual meeting recently at the offices of the new buildings of the company, in Neenah. Luncheon was served at the Valley Inn of that city.

Howard Brabender, employed in the Peshtigo Paper Company Mill, at Peshtigo, met with a severe injury Wednesday when employed on one of the large paper machines. He inserted his right hand between some calender rolls, and his hand was temporarily caught, incurring friction burns and a wrist fracture. The accident will keep him an invalid for several weeks.

Frank Forsbrey Visits Havana

Frank E. Forsbrey of the Pulp and Paper Trading Company, 21 East 41st street, New York and Mrs. Forsbrey have just returned from a trip to Havana where, after seeing all the sights and places of general interest and inspecting the military camps and radio station under the guidance of Captain Romulo Masvidal Albrecht, Mr. Forsbrey visited the local paper mill—Papelera Cubana, S. A. in Puentes Grandes, Habana, Cuba and was received by the director—Senor Eduardo I. Montoulieu. He was particularly interested in the modern equipment and also pleased with the delightful reception given him by the director.

After leaving Havana, Mr. and Mrs. Forsbrey proceeded to Miami via the Peninsular and Occidental S. S. Line to Key West. They found a number of paper friends in Miami who were also investigating the real estate developments in Florida.

Beaver Wood Fibre Co. Makes News Print

The plant of the Beaver Wood Fibre Co., of Thorold, Ont., began the making of newsprint. Instead of shipping raw material to the United States there to be converted into the finished product at greatly enhanced values, it now undergoes the process of being finished in Canada and gives employment to a large number of men. The machine turns out about 70 tons of news print daily. Five months were reqiured in construction and installing therein of the machine, a 166 inch Pusey and Jones Fourdrinier. The work has been carried out by the company under the supervision of H. S. Ferguson, paper mill engineer of New York city. The building is of the latest construction type, is fireproof throughout and consists of concrete, brick, re-inforcing and structional steel.

McDowell Mills Installs New Devices

With the addition of three embossing machines, the McDowell Paper Mills, of the Manayunk paper manufacturing district of Philadelphia, is able to produce many designs in its glassine products. In the mid year there were added two of these designs, the herring bone and spider web, and within recent weeks the pique embossing machines, so that a complete assortment of the most popular glassine figures now may be had. These are among the specialties which the McDowell Mills produce along with its standard grease proof and glassine papers and fancy wrappings. The entire plant is now electrified with individual motors and a new pulp house for storing imported Swedish wood pulp has been built on the site of the mills within the past few months. With the installation of the electrical units the mills are now so equipped that they can be run either with water power or with electricity and are safe from interference of low waters that often inconvenience operation.

Will of Late W. M. Gilbert

Under the terms of the will of the late William M. Gilbert, president of the Gilbert Paper Company, of Menasha, Wis., all of the stock owned by the decedent in the paper company is bequeathed to the wife, Mary Felker Gilbert, and to the son, Albert C. Gilbert.

The bequest to the widow is made under certain conditions: In case Mrs. Gilbert decided to sell the stock she is to offer the son the opportunity to buy it at book value, with six months in which to exercise his right to purchase it, and during Mrs. Gilbert's possession of the stock the son is to vote it.

The residue of the property, real and personal, is bequeathed to the widow. The son, Albert C. Gilbert, and W. G. Brown, both of Neenah, are named executors. According to the petition the personal property bequeathed by the decedent was not in excess of $200,000.

To Build Paper Mill at River Rouge

The Consolidated Paper Company, of Monroe, Mich, has purchased real estate comprising about seven acres, including a steel and concrete building adjacent to the River Rouge in the city of River Rouge, and expects to start the erection, as soon as the weather will permit, of a plant in which it will manufacture waterproof automobile panel boards.

The equipment for this plant will be taken out of the plant in Monroe, located on Roosevelt avenue.

The city of River Rouge is entering into a contract with the Consolidated Paper Company to take care of all of the sewerage of this plant, and will construct for the company a 24 inch sewer connecting its plant with the city's trunk line sewer.

Start New Bates Bag Plant

On February 6 the first unit for making Bates "Multi-wall" cement bags was started in the new bag factory leased from and located at the plant of the Nashua River Paper Company, East Pepperell, Mass., which is the manufacturer of the well-established brand of "Primus" kraft paper. Additional units are rapidly being installed and within the next six weeks the plant will be running at capacity.

This should work out to the mutual advantage of both companies inasmuch as the bag company receives its paper direct from the paper machines, eliminating extra handling and freight charges in distribution, while the Nashua River Paper Company is assured of a steady consumption of a large percentage of its production.

Penn Fibreboard Corp. Improvements

Production in the plant of the Penn Fibreboard Corporation, of York, Pa., has been materially increased through the installation of additional beaters and the development of its power facilities. There has been purchased power to increase its tonnage of boards in manilas, chip and test grades. Four of the beaters were electrified with slip ring motors and two of the Jordans with synchronous motors. The plant will be further expanded by the addition of two beaters manufactured by the Downingtown Manufacturing Company, the latter company having already secured contract for the installation of these additional beater units.

Goes With Martin Cantine Co.

E. B. Skinner, recently of the General Paper Goods Company, of San Francisco, Cal., is now connected with the Martin Cantine Company of Saugerties,, N. Y. as its Pacific Coast representative.

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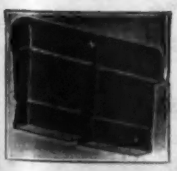

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Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 27, 1926

SUMMARY

Cigarette paper	2,525 cs.
Wall paper	114 bls., 6 pgs., 7 cs.
Paper hangings	65 bls., 38 cs.
News print	168 rolls
Printing paper	116 cs.
Wrapping paper	315 bls., 12 rolls, 76 bdls., 46 cs.
Packing paper	58 bls., 231 rolls, 84 cs.
Kraft paper	556 rolls
Photo paper	3 cs.
Drawing paper	86 cs.
Filter paper	16 cs.
Surface coated paper	5 cs.
Metal coated paper	38 cs.
Gold coated paper	4 cs.
Colored paper	45 cs.
Pergamyn paper	72 cs.
Writing paper	23 cs.
Silk paper	22 cs.
Tissue paper	32 cs.
Cover paper	4 cs.
Paper tubes	18 cs.
Paper spools	33 cs.
Gelatine paper	1 cs.
Garnet paper	21 cs.
Flintstone paper	26 cs.
Trunk paper	1 cs.
Straw board	359 rolls
Miscellaneous paper	103 bls., 667 rolls, 10 pkgs., 278 cs.

CIGARETTE PAPER

Liggett & Myers Tobacco Co., De Grasse, Havre, 15 cs.

American Tobacco Co., Sarcoxie, Bordeaux, 1,000 cs.

R. J. Reynolds Tobacco Co., Sarcoxie, St. Nazaire, 1,040 cs.

De Manduit Paper Corp., Sarcoxie, St. Nazaire, 340 cs.

Standard Products Corp., Waukegan, Havre, 130 cs.

WALL PAPER

F. J. Emmerich, Montpelier, Hamburg, 40 bls., 4 cs. (5,465 kilos).

F. J. Emmerich, Deutschland, Hamburg, 25 bls., 1 cs. (2,480 kilos).

F. J. Emmerich, Caronia, Liverpool, 6 bls. (1,338 lbs.).

F. J. Emmerich, Minnewaska, London, 4 bls.

R. F. Downing & Co., Minnewaska, London, 4 bls., 1 cs.

R. F. Downing & Co., Vardulia, London, 35 bls.

Thomas & Pierson, Olympic, Southampton, 1 cs.

A. C. Dodman, Jr., Inc., Olympic, Southampton, 6 pgs.

PAPER HANGINGS

W. H. S. Lloyd & Co., Minnewaska, London, 52 bls., 14 cs.

W. H. S. Lloyd & Co., Caronia, Liverpool, 6 bls., 1 cs. (1,008 lbs.).

A. C. Dodman, Jr., Inc., Caronia, Liverpool, 7 bls., 23 cs. (14,382 lbs.).

NEWS PRINT

Irving Bank-Columbia Trust Co., Arabic, Hamburg, 168 rolls.

PRINTING PAPER

J. Henschel & Co., Montpelier, Hamburg, 5 cs. (565 kilos).

E. Dietzgen & Co., Deutschland, Hamburg, 10 cs. (1,138 kilos).

Keuffel & Esser, Deutschland, Hamburg, 33 rolls (2,689 kilos).

B. F. Drakenfeld & Co., Cedric, Liverpool, 34 cs.

E. Dietzgen & Co., Innoko, Rotterdam, 14 cs. (2,284 kilos).

Titan Shipping Co., Olympic, Southampton, 34 cs.

Defiance Sales Co., Olympic, Southampton, 19 cs.

WRAPPING PAPER

Armour & Co., Sarcoxie, Bordeaux, 60 bls.

C. Steiner, Montpelier, Hamburg, 18 cs. (3,752 kilos).

Irving Bank-Columbia Trust Co., Deutschland, Hamburg, 176 bls. (13,037 kilos).

T. Barret & Son, Gripsholm, Gothenburg, 67 bls.

C. K. MacAlpine & Co., Gripsholm, Gothenburg, 12 bls.

Wilkinson Bros. & Co., Inc., Gripsholm, Gothenburg, 28 cs.

Blauvelt, Wiley Paper Mfg. Co., Tuscania, Glasgow, 76 bdls.

Safety Insulated Wire Cable Co., Tuscania, Glasgow, 12 rolls.

PACKING PAPER

J. P. Heffernan Paper Co., Volendam, Rotterdam, 8 bls.

J. P. Heffernan Paper Co., Gripsholm, Gothenburg, 50 bls.

Irving Bank-Columbia Trust Co., Binnendyk, Rotterdam, 24 cs.

Rohner & Gehrig Co., Deutschland, Hamburg, 60 cs. (11,182 kilos).

Okonite Callender Cable Co., Amer. Merchant, London, 231 rolls (46,370 lbs.).

KRAFT PAPER

Arkell Safety Bag Co., Gripsholm, Gothenburg, 556 rolls.

PHOTO PAPER

J. J. Gavin, Cedric, Liverpool, 3 cs.

DRAWING PAPER

Susquehanna Silk Mills, De Grasse, Havre, 1 cs.

Devoe & Reynolds, Minnewaska, London, 2 cs.

Favor, Ruhl & Co., Minnewaska, London, 8 cs.

Keuffel & Esser, Deutschland, Hamburg, 75 cs. (13,320 kilos).

FILTER PAPER

C. Schleicher Schull & Co., Montpelier, Hamburg, 3 cs. (312 kilos).

Lunham & Reeve, Minnewaska, London, 1 cs.

Zinkeisen & Co., Deutschland, Hamburg, 3 cs. (206 kilos).

H. Reeve Angel & Co., Inc., Minnewaska, London, 9 cs.

SURFACE COATED PAPER

Whiting & Patterson Co., Arabic, Hamburg, 4 cs.

Phoenix Shipping Co., Deutschland, Hamburg, 1 cs. (67 kilos).

METAL COATED PAPER

Hensel, Bruckman & Lorbacher, Arabic, Hamburg, 24 cs.

H. D. Catty & Co., Muenchen, Bremen, 14 cs.

GOLD COATED PAPER

C. B. Richard & Co., Muenchen, Bremen, 4 cs.

COLORED PAPER

P. H. Petry & Co., Montpelier, Hamburg, 32 cs. (5,970 kilos).

P. H. Petry & Co., Deutschland, Hamburg, 13 cs. (2,665 kilos).

PERGAMYN PAPER

F. C. Strype, Arabic, Hamburg, 18 cs.

F. C. Strype, Deutschland, Hamburg, 14 cs. (2,215 kilos).

F. C. Strype, Montpelier, Hamburg, 30 cs. (4,289 kilos).

Irving Bank-Columbia Trust Co., Montpelier, Hamburg, 10 cs. (2,776 kilos).

WRITING PAPER

L. Bamberger & Co., Waukegan, Havre, 1 cs.

Republic Bag & Paper Co., Volendam, Rotterdam, 22 cs.

SILK PAPER

F. C. Strype, Montpelier, Hamburg, 22 cs. (3,181 kilos).

TISSUE PAPER

Standard Products Corp., Waukegan, Havre, 30 cs.

S. Gilbert, Binnendyk, Rotterdam, 2 cs.

COVER PAPER

International Forwarding Co., Deutschland, Hamburg, 4 cs. (415 kilos).

PAPER TUBES

H. de Maguinn, De Grasse, Havre, 18 cs.

PAPER SPOOLS

J. I. Bernitz, Muenchen, Bremen, 33 cs.

GELATINE PAPER

Fuchs & Lang Mfg. Co., Montpelier, Hamburg, 1 cs. (103 kilos).

GARNET PAPER

United Hardware & Tool Corp., Muenchen, Bremen, 21 cs.

FLINTSTONE PAPER

United Hardware & Tool Corp., Muenchen, Bremen, 26 cs.

TRUNK PAPER

P. H. Petry & Co., Deutschland, Hamburg, 1 cs. (220 kilos).

STRAW BOARD

A. Vuyk, Volendam, Rotterdam, 359 rolls.

MISCELLANEOUS PAPER

A. C. Dodman, Jr., Inc., De Grasse, Havre, 1 cs.

C. H. Boulin, De Grasse, Havre, 8 cs.

Perkins, Goodwin & Co., Arabic, Hamburg, 168 rolls.

A. E. MacAdam & Co., Volendam, Rotterdam, 10 pkgs.

C. Schleicher Schull & Co., Deutschland, Hamburg, 2 cs. (358 kilos).

S. Gabriel & Son, Deutschland, Hamburg, 5 cs. (1250 kilos).

F. C. Strype, Deutschland, Hamburg, 1 cs. (200 kilos).

T. Barret & Son, Gripsholm, Gothenburg, 42 bls.

Universal Paper Co., Gripsholm, Gothenburg, 61 bls., 317 rolls.

The Borregaard Co., Inc., Gripsholm, Gothenburg, 182 rolls.

E. H. Sergeant & Co., Gripsholm, Gothenburg, 3 cs.

Perry, Ryer & Co., Tuscania, Glasgow, 239 cs.

Whiting & Patterson Co., Olympic, Southampton, 19 cs.

RAGS, BAGGINGS, ETC.

L. H. Abenheimer, Carso, Genoa, 171 bls. bagging.

Royal Manfg. Co., Carso, Genoa, 53 bls. cotton waste.

Amsinck, Sonne & Co., Inc., Carso, Leghorn, 14 bls. rags.

Amsinck, Sonne & Co., Inc., Coer d'Alene, Constantinople, 457 bls. rags.

L. H. Abenheimer, Clontarf, Genoa, 95 bls. bagging.

Mechanics & Meta's Natl. Bank, Clontarf, Alexandria, 160 bls. rags.

National Bank of Commerce, Fenchurch, Marseilles, 74 bls. rags.

Castle & Overton, Inc., Fenchurch, Barcelona, 68 bls. bagging.

Mechanics & Metals Natl. Bank, Arabic, Hamburg, 265 bls. rags.

E. J. Keller Co., Inc., Arabic, Hamburg, 34 bls. rags.

Darmstadt, Scott & Courtney, Arabic, Hamburg, 90 bls. rags.

Castle & Overton, Inc., Arabic, Hamburg, 25 bls. rags.

Irving Bank-Columbia Trust Co., Arabic, Hamburg, 141 bls. rags.

American National Bank, Arabic, Hamburg, 40 bls. rags.

V. Galaup, Waukegan, Havre, 421 bls. rags.

The Stone Bros. Co., Inc., Waukegan, Havre, 11 bls. rags.

The Stone Bros. Co., Inc., Waukegan, Havre, 35 bls. string waste.

J. M. Jaffe, Waukegan, Havre, 62 bls. rags.

Atterbury Bros., Inc., Waukegan, Havre, 18 bls. rags.

Maurice O'Meara Co., Waukegan, Havre, 52 bls. rags.

Royal Manfg. Co., Waukegan, Dunkirk, 44 bls. cotton waste.

Maurice O'Meara Co., Waukegan, Dunkirk, 96 bls. bagging.

Castle & Overton, Inc., Montpelier, Hamburg, 61 bls. rags.

E. J. Keller Co., Inc., Montpelier, Hamburg, 210 bls. bagging.

E. J. Keller Co., Inc., Montpelier, Hamburg, 52 bls. new cuttings.

Marx Maier Papermill Supply Co., Montpelier, Hamburg, 125 bls. bagging.

The Barret Co., Montpelier, Hamburg, 175 bls. bagging.

Urania Trading Co., Montpelier, Hamburg, 28 bls. rags.

Castle & Overton, Inc., Muenchen, Bremen, 59 bls. rags.

E. J. Keller Co., Inc., Muenchen, Bremen, 39 bls. rags.

Darmstadt, Scott & Courtney, Cabo Hatteras, Marseilles, 82 bls. bagging.

Maurice O'Meara Co., Cabo Hatteras, Marseilles, 27 bls. bagging.

Castle & Overton, Inc., Cabo Hatteras, Genoa, 14 bls. cotton waste.

The Stone Bros. Co., Inc., Binnendyk, Rotterdam, 114 bls. rags.

National City Bank, Binnendyk, Rotterdam, 26 bls. rags.

E. Butterworth & Co., Inc., Volendam, Rotterdam, 66 bls. bagging.

Marx Maier Paper Mill Supply Co., Volendam, Rotterdam, 51 bls. bagging.

Perry, Ryer & Co., Volendam, Rotterdam, 37 bls. rags.

Atlas Waste Manfg. Co., Volendam, Rotterdam, 41 bls. rags.

National Bank of Commerce, Sinsinawa, Leghorn, 299 bls. rags.

B. D. Kaplan, Artigas, Liverpool, 10 bls. rags.

The Stone Bros. Co., Inc., Artigas, Liverpool, 17 bls. rags.

Adams Co., Artigas, Liverpool, 20 bls. picker waste.

M. Snedeker Corp., Galtymore, Belfast, 46 bls. paper stock.

C. R. Spence, Galtymore, Belfast, 90 bls. rags.

The Stone Bros. Co., Inc., Galtymore, Dundee, 12 bls. rags.
Guaranty Trust Co., Galtymore, Leith, 78 bls. bagging.
New York Trust Co., Galtymore, Leith, 64 bls. bagging.
A. W. Fenton, Inc., Ossa, Alexandria, 349 bls. rags.
J. Cohen Son & Co., Caronia, Liverpool, 22 bls. rags.
B. D. Kaplan, Caronia, Liverpool, 20 bls. rags.
The Stone Bros. Co., Inc., Caronia, Liverpool, 9 bls. rags.
Central National Bank of Cleveland, Caronia, Liverpool, 58 bls. rags.
Darmstadt, Scott & Courtney, Deutschland, Hamburg, 31 bls. rags.
R. Blank, Deutschland, Hamburg, 19 bls. rags.
East River Natl. Bank, Deutschland, Hamburg, 56 bls. rags.
E. J. Keller Co., Inc., Deutschland, Copenhagen, 434 bls. rags.
E. J. Keller Co., Inc., Deutschland, Hamburg, 1,135 bls. rags.
E. J. Keller Co., Inc., Deutschland, Hamburg, 150 bls. bagging.
Guaranty Trust Co., Deutschland, Hamburg, 25 bls. rags.
R. Blank, Deutschland, Hamburg, 78 bls. rags.
Pennrich Co., Deutschland, Hamburg, 35 bls. rags.
E. Mayer, Deutschland, Hamburg, 62 bls. rags.
Salomon Bros. & Co., Deutschland, Hamburg, 96 bls. bagging.
National Bank of Commerce, Vardulia, London, 77 bls. rags.
Fass Woolstock Corp., Vardulia, London, 45 bls. rags.
E. J. Keller Co., Inc., Denham, Barcelona, 125 bls. rags.
National City Bank, Denham, Barcelona, 73 bls. rags.
American Woolstock Corp., Thames Maru, Hamburg, 7 bls. rags.
E. Mayer, Thames Maru, Hamburg, 7 bls. rags.
J. Munro & Co., Tuscania, Glasgow, 74 bls. rags.
Baring Bros. & Co., Tuscania, Glasgow, 57 bls. rags.
Brown Bros. & Co., Tuscania, Glasgow, 39 bls. new cuttings.
Castle & Overton, Inc., Innoko, Rotterdam, 34 bls. rags.
East River Natl. Bank, Innoko, Rotterdam, 117 bls. rags.
G. M. Graves Co., Innoko, Rotterdam, 212 bls. bagging.
Marx Maier Papermill Supply Co., Innoko, Rotterdam, 170 bls. rags.
Kidder, Peabody Accep. Corp., Burgondier, Antwerp, 117 bls. bagging.
Castle & Overton, Inc., Berlin, Bremen, 38 bls. rags.
Castle & Overton, Inc., Berlin, Bremen, 53 bls. new cuttings.
Castle & Overton, Inc., Mercier, Antwerp, 6 bls. rags.
Castle & Overton, Inc., Mercier, Antwerp, 164 bls. new cuttings.
Castle & Overton, Inc., Pr. Roosevelt, Bremen, 78 bls. new cuttings.
E. J. Keller Co., Inc., Davisian, Manchester, 48 bls. rags.
E. J. Keller Co., Inc., Finland, Shanghai, 201 bls. rags.
E. J. Keller Co., Inc., Hawaiian, Kobe, 25 bls. rags.

OLD ROPE

Cohen & Co., Munargo, Nassau, 5 bls.
Brown Bros. & Co., Binnendyk, Rotterdam, 57 coils.
Brown Bros. & Co., Volendam, Rotterdam, 43 coils.
Brown Bros. & Co., Chicago City, Bristol, 100 coils.
A. H. Searle, Vardulia, London, 198 coils.

MANILA ROPE

Ellermans' Wilson Line, Minnewaska, London, 125 coils.

HEMP ROPE

National City Bank, Cedric, Liverpool, 97 pgs.

WOOD PULP

Castle & Overton, Inc., Montpelier, Hamburg, 2,109 bls. wood pulp, 421 tons.
Tidewater Papermills Co., Bornholm, Liverpool, N. S., 12,152 bls. wood pulp.
Johanson, Wales & Sparre, Inc., Gripsholm, Gothenburg, 526 bls. sulphite.
Johanson, Wales & Sparre, Inc., Gripsholm, Gothenburg, 598 bls. dry soda pulp.
E. M. Sergeant & Co., Gripsholm, Gothenburg, 257 bls. sulphite pulp.
Price & Pierce, Ltd., Gripsholm, Gothenburg, 3,480 bls. wet pulp.
Atterbury Bros., Inc., Thames Maru, Hamburg, 666 bls. wood pulp, 102 tons.
H. Hollesen, Inc., Thames Maru, Hamburg, 434 bls. sulphite, 61 tons.
Nilsen, Lyon & Co., Inc., Thames Maru, Hamburg, 600 bls. wood pulp, 93 tons.
Castle & Overton, Inc., Thames Maru, Hamburg, 511 bls. wood pulp, 102 tons.
Johanson, Wales & Sparre, Inc., Sagoporack, Hernosand, 7,020 bls. sulphite pulp, 1,370 tons.
M. Gottesman & Co., Inc., Volendam, Rotterdam, 1,310 bls. wood pulp.

WOOD PULP BOARDS

M. Meyerson, Gripsholm, Gothenburg, 29 bls.

WOOD FLOUR

The Bakelite Corp., Innoko, Rotterdam, 649 bags, 52,340 kilos.
B. L. Soberski, Innoko, Rotterdam, 3,000 bags, 150,000 kilos.

CASEIN

Allidinite Chemical Co., Montpelier, Hamburg, 275 bags.
Casein Manfg. Co., Vandyck, Buenos Aires, 417 bags.
Casein Manfg. Co., America, Buenos Aires, 833 bags.

NEW ORLEANS IMPORTS

WEEK ENDING FEBRUARY 27, 1926

Castle & Overton, Inc., Topa Topa, London, 188 bls. rags.
Castle & Overton, Inc., Gand, Havre, 196 bls. rags.
Castle & Overton, Inc., Ogontz, Barcelona, 150 bls. rags.
Castle & Overton, Inc., Coldbrook, Antwerp, 395 bls. rags.
E. J. Keller Co., Inc., Coldbrook, Antwerp, 26 bls. bagging.
E. J. Keller Co., Inc., West Norranus, Hamburg, 66 bls. bagging.
E. J. Keller Co., Inc., West Norranus, Hamburg, 197 bls. rags.

NORFOLK IMPORTS

WEEK ENDING FEBRUARY 27, 1926

Johanson, Wales & Sparre, Inc., Sagoporack, Hernosand, 4,440 bls. sulphite pulp, 740 tons.

CHARLESTON IMPORTS

WEEK ENDING FEBRUARY 27, 1926

E. J. Keller Co., Inc., Coldwater, Bremen, 158 bls. bagging.

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 27, 1926

E. H. Bailey & Co., Galtymore, Leith, 67 cs. paper.
Paper Service Co., Thames Maru, Hamburg, 3 pgs. wrapping paper, 40 kilos.
Chemical National Bank, Thames Maru, Hamburg, 87 rolls news print, 24,989 kilos.
Nilsen, Lyon & Co., Inc., Thames Maru, Hamburg, 602 bls. wood pulp, 93 tons.
Castle & Overton, Inc., Thames Maru, Hamburg, 750 bls. wood pulp, 150 tons.
D. I. Murphy, Thames Maru, Hamburg, 106 bls. rags.
Brown Bros. & Co., Thames Maru, Hamburg, 47 bls. rags.
S. Birkenstein & Sons, Thames Maru, Hamburg, 90 bls. rags.
Fidelity International Trust Co., Thames Maru, Hamburg, 68 bls. rags.
E. J. Keller Co., Inc., Thames Maru, Hamburg, 44 bls. rags.
Philadelphia National Bank, Thames Maru, Hamburg, 60 bls. rags.
Baltimore Trust Co., Hog Island, Marseilles, 102 bls. rags.
A. W. Fenton, Inc., Galtymore, Belfast, 40 bls. rags.
Old Colony Trust Co., Galtymore, Leith, 93 coils old rope.
New York Trust Co., Galtymore, Leith, 137 coils old rope.
Grace National Bank, Carso, Naples, 147 bls. rags.
Mechanics & Metals Natl. Bank, Carso, Naples, 163 bls. rags.
Philadelphia National Bank, Coer d'Alene, Algiers, 180 bls. rags.
E. J. Keller Co., Inc., Seattle Spirit, Hamburg, 156 bls. rags.
E. J. Keller Co., Inc., Sarcoxie, St. Nazaire, 831 bls. rags.
Anglo-South American Trust Co., Sarcoxie, St. Nazaire, 30 bls. cotton waste.
National City Bank, Fenchurch, Marseilles, 241 bls. rags.
W. Schall & Co., Fenchurch, Marseilles, 147 bls. rags.
E. J. Kel'er Co., Inc., Fenchurch, Marseilles, 166 bls. rags.
Congoleum Nairn Co., Fenchurch, Marseilles, 78 bls. rags.
Castle & Overton, Inc., Sinsinawa, Leghorn, 556 bls. rags.
Johanson, Wales & Sparre, Inc., Sagoporack, Hernosand, 960 bls. sulphite pulp, 1,600 tons.
Castle & Overton, Inc., Nessian, Antwerp, 68 bls. rags.
Castle & Overton, Inc., Oakspring, Rotterdam, 396 bls. rags.
Castle & Overton, Inc., Oakspring, Rotterdam, 140 bls. wood pulp.
Castle & Overton, Inc., Eastern Victor, Rotterdam, 630 bls. wood pulp.
Castle & Overton, Inc., Gottingen, Germany, 572 bls. rags.
Castle & Overton, Inc., Blydendyk, Antwerp, 309 bls. rags.
Castle & Overton, Inc., Western Plains, Rotterdam, 12 bls. rags.
E. J. Keller Co., Inc., Hefron, Kobe, 915 bls. rags.
E. J. Keller Co., Inc., Kansan, Kobe, 250 bls. rags.
E. J. Keller Co., Inc., Nessian, Amsterdam, 546 bls. rags.
E. J. Keller Co., Inc., Carso, Naples, 163 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 27, 1926

H. Hollesen, Inc., West Harcuvar, Hamburg, 665 bls. wood pulp, 133 tons.
M. Gottesman & Co., Inc., Chifuku Maru, Trieste, 1,201 bls. wood pulp.
Castle & Overton, Inc., Sulina, Sweden, 203 bls. wood pulp.
Castle & Overton, Inc., Eastern Victor, Rotterdam, 300 bls. wood pulp.
Castle & Overton, Inc., West Harcuvar, Hamburg, 1,500 bls. wood pulp.
E. J. Keller Co., Inc., Bilderdyk, Mannheim, 600 bls. wood pulp.
E. J. Keller Co., Inc., Bilderdyk, Karlsruhe, 300 bls. wood pulp.
E. J. Keller Co., Inc., Bilderdyk, Antwerp, 199 bls. flax waste.
E. J. Keller Co., Inc., Sac City, Antwerp, 136 bls. bagging.
E. J. Keller Co., Inc., West Harcuvar, Bremen, 159 bls. rags.
National Bank of Commerce, Waukegan, Havre, 674 bls. rags.
Baltimore Trust Co., Waukegan, Havre, 73 bls. rags.
Maryland Waste Co., Waukegan, Havre, 20 bls. rags.
S. Shapiro & Co., Waukegan, Havre, 121 bls. rags.
Congoleum Nairn Co., Waukegan, Dunkirk, 43 bls. rags.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 27, 1926

G. M. Graves Co., Thames Maru, Hamburg, 176 bls. rags.
Fidelity International Trust Co., Thames Maru, Hamburg, 162 bls. rags.
International Mercantile Marine Co., Thames Maru, Hamburg, 54 bls. rags.
Reis & Co., Thames Maru, Hamburg, 102 bls. cotton waste.
E. J. Keller Co., Inc., Thames Maru, Hamburg, 44 bls. rags.
W. Hartman & Co., Inc., Thames Maru, Hamburg, 1,005 bls. wood pulp, 155 tons.
W. Hartman & Co., Inc., Thames Maru, Hamburg, 600 bls. kraft pulp, 60 tons.
Castle & Overton, Inc., Thames Maru, Hamburg, 1,005 bls. wood pulp.
Maurice O'Meara Co., Thames Maru, Hamburg, 5 cs. parchment paper.
Johanson, Wales & Sparre, Inc., Sagoporack, Hernosand, 1,080 bls. sulphite pulp, 180 tons.
Johanson, Wales & Sparre, Inc., Sagoporack, Hernosand, 7,200 bls. sulphate pulp, 1,200 tons.
Castle & Overton, Inc., West Harcuvar, Hamburg, 450 bls. wood pulp.
Castle & Overton, Inc., West Inskip, Rotterdam, 300 bls. wood pulp.
E. J. Keller Co., Inc., Seattle Spirit, Hamburg, 119 bls. rags.
E. J. Keller Co., Inc., Sacandaga, Rotterdam, 114 bls. rags.
E. J. Keller Co., Inc., Sacandaga, Rotterdam, 251 bls. bagging.
E. J. Keller Co., Inc., Nessian, Amsterdam, 49 bls. rags.
E. J. Keller Co., Inc., West Harcuvar, Hamburg, 62 bls. rags.

New York Market Review

Office of THE PAPER TRADE JOURNAL,
Wednesday, March 3, 1926.

During the past week, trading in the local paper market continued along satisfactory lines, and an excellent demand was experienced for the different grades of paper. A strenuous spring campaign is anticipated by the sales organizations of the leading paper houses, and a decided feeling of optimism prevails throughout the entire industry. Prices are reported to be generally firm, and it is said that there is very little prospect of concessions being made in the immediate near future.

Stimulated by the new contract prices which came into effect at the beginning of the year, the news print market continues to expand. Production, both in the United States and Canada, is proceeding at a rapid pace, and consumption still remains heavy. Stocks on hand are rather limited, and, as a consequence, the spot market is very firm.

A steady demand prevails for the various grades of paper board, and prices are holding up well. Some improvement has developed in the fine paper market, and a good volume of orders are being received from the printers. The coarse paper industry is in an excellent position, and the tone of the market is strong. With the approach of Easter, department stores and other large consumers are showing more interest in the wrapping paper market, and the demand is expanding steadily.

Mechanical Pulp

Prices are still very firm in the mechanical ground wood market. The output has been affected slightly by recent weather conditions, and offerings are strictly limited. Scandinavian ground wood is still quoted at considerably higher prices than American pulp. Domestic ground wood is now being quoted at from $30 to $33, f.o.b., mill, while imported is quoted at from $40 to $45 a ton, ship side.

Chemical Pulp

The chemical pulp market continues in a strong position and prices are being well maintained. The foreign mills, and the importers in this country, are reported to be sold out at a considerable time ahead, while the domestic chemical wood pulp mills are said to be well placed as regarding standing orders on their books. Incidentally, it is believed that the board and paper mills have mostly covered their requirements for some time ahead.

Old Rope and Bagging

Increased interest is being shown in old rope by the paper mills. Prices, however, are not stronger, foreign manila rope being quoted at from 5 to 5.25 cents and domestic at from 5.75 to 6 cents. The price of small mixed ropes is unchanged. Bagging has been moving to the paper mills in a fairly satisfactory manner and prices remain firm.

Rags

Medium grades of rags are in much better demand than for some time and more interest is also being manifested in the higher grades. A very satisfactory amount of business has also been transacted in the lower grades of rags. The market for foreign cuttings is practically unchanged and prices continue to be well maintained at the recently quoted basis.

Waste Paper

The demand for waste paper is improving somewhat although prices have been inclined to fluctuate. The packers have initiated a concerted movement to cut down their buying prices, of which much is expected. The lower grades of waste paper are in fairly good request, while some improvement has been noted in the demand for the higher grades.

Twine

Influenced by the increasing demand for wrapping paper for spring and Easter requirements, the twine market is exhibiting a strong tendency and prices are being well maintained. Close observers of the situation are predicting a good year for the industry, which has certainly made a better beginning this year than in the early months of 1925.

CONFIDENCE IN PHILADELPHIA

(*Continued from page 32*)

new month, begin the distribution of fine papers in this city, featuring the specialized products of the American Writing Paper Company, and including 46 varieties and grades of papers, among them the nationally known Eagle A Papers. The new home is a modern structure with two large floors devoted to the business of fine paper distributing. While the warehouses and executive and sales offices will be assembled in the Cherry street headquarters, the converting department and factory will be continued at 804 Sansom street, where Anthony Richie, head of the firm, has long been established in the ruling and paper finishing business. Here will be perfected plans for other forms of paper conversion which will facilitate the distribution of fine papers handled under the newly formed paper company. Though the doors will be thrown open for business this week, a social gathering is planned for a later date in celebration of the event when the members of the firm and its staff of workers will join at the dinner table with its patrons in the printing and allied industries.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 3, 1926.—The Government Printing Office has received the following bids for 40,000 pounds of U. S. Postal card bristol in 22½" rolls; American Writing Paper Company, at 7 cents per pound; Dill & Collins Company, 6.75 cents; R. P. Andrews Paper Company, at 5.74 cents; Champion Fibre Company, 5.65 cents.

The Government Printing Office will receive bids on March 8 for 10,500 pounds (350 reams) of 12 x 18 30, wood manila tag board.

Hewittville Pulp Mill Burns

POTSDAM, N. Y., March 1, 1926.—The Hewittville mill of the Raquette River Paper company, about three miles northwest of Potsdam, on the Raquette river, burned to ground February 17. The mill and its contents were valued at more than $80,000. It is believed that some of the machinery can be salvaged but the rest is a total loss. The plant was covered by insurance.

The origin of the fire is not definitely known but it is believed that it started from a short circuit in the generator.

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Miscellaneous Markets

Office of THE PAPER TRADE JOURNAL,
Wednesday, March 3, 1926.

Conditions in the local chemical market were quite favorable during the past week. As compared with the preceding seven days, the volume of sales showed a satisfactory increase, and the manufacturers also reported an excellent contract withdrawal movement. In the opinion of many observers spot prices are due for a slight advance in the near future.

BLANC FIXE.—Trading in the blanc fixe market has been very quiet and purchasers are apparently not operating far in advance of their needs for this product. Prices are unaltered. The pulp is selling at from $60 to $64 a ton, and the powder at from 3¾ to 4½ cents a pound, in barrels, car lots, at works.

BLEACHING POWDER.—The bleaching powder market is in a strong position. Producers are largely sold ahead and production is moving into consumption very quickly. Contract withdrawals have been large of late. Bleaching powder is quoted at from $2 to $2.40 per 100 pounds, in large drums, at works.

CAUSTIC SODA.—Activity again prevailed in the caustic soda market. The movement on contract proceeded in a satisfactory manner. Due to keen competition for business there has been some reports of shading. The spot market remained fairly steady. Quotations on caustic soda range from $3.10 to $3.15 per 100 pounds, at works. Spot car lots are selling at from $3.20 to $3.25 per 100 pounds.

CASEIN.—Domestic and foreign casein is in good demand and the market exhibits a strong undertone. Contract withdrawals have been proceeding along routine lines and prices of all grades are firm. Domestic casein is still quoted at from 13 to 14 cents a pound, according to grade, and imported casein at 13½ cents a pound, all in bags.

CHINA CLAY.—While spot trading has been below normal a good demand was experienced during the week for both domestic and imported grades for shipment on contract. Prices are holding up well. Domestic washed clay is selling at $8 a ton, at mine, and pulverized at $10 a ton. Foreign china clay is quoted at from $13 to $22 a ton, ship side.

CHLORINE.—Producers of chlorine are said to be well sold up, and firmness prevails in the market. Contract shipments are going forward in good volume and prices remain very steady. The present quotation for chlorine is 4 cents a pound, in tanks, or multi-unit cars, at works, on contract orders. The spot quotation is half a cent higher.

ROSIN.—Very little improvement has been noticed in the rosin market. Occasional spurts have been experienced but offerings have been limited. Prices are rather weaker at the time of writing. Paper makers grades of rosin are quoted at from $13.50 to $14.15 per 280 pounds, ship side, in barrels.

SALT CAKE.—Business was again active in the salt cake market, and a good volume of inquiries have been received from the paper mills for future orders. Contract withdrawals have been excellent and prices are being well maintained. Salt cake is still selling at from $17 to $20 a ton, in bulk, at works.

SODA ASH.—The demand for soda ash is quite as large as prevailed at the corresponding period of last year. The average of shipments on contract is also being well maintained. The tone of the market is decidedly firm. Contract quotations, in car lots, at works, per 100 pounds, were as follows: In bulk, $1.25; in bags, $1.38, and in barrels, $1.63.

STARCH.—Contract withdrawals of starch are about normal for the time of the year, and prices show little variation. The demand from the paper mills continues on routine lines and offerings are about sufficient to take care of immediate requirements. Special paper makers starch is selling at $3.32 per 100 pounds, in bags, and $3.49 in barrels.

SULPHATE OF ALUMINA.—An improved demand was experienced in the sulphate of alumina market. More new orders were received by the manufacturers during the past week than in the preceding seven days. Sulphate of alumina is selling at from $2 to $2.05 per 100 pounds, for the iron free, in bags, at works, in car lots, and at from $1.40 to $1.45 for commercial.

SULPHUR.—The demand for sulphur continues to expand, and the market is exhibiting a steady tone. Consumption is steadily increasing and contract withdrawals are moving in a highly satisfactory manner. Sulphur is quoted at from $14 to $16 a ton, in bulk, at mine, and at from $20 to $21 a ton, ship side.

TALC.—Some improvement was experienced during the week in the talc market and a good volume of transactions are reported to have taken place. Contract withdrawals have also been moving at a satisfactory pace. Talc is quoted at from $16 to $18 a ton, at eastern mines, according to grade.

GUILTY OF STREAM POLLUTION

(*Continued from page 28*)

change in ownership will not, however, affect the present management, for it will be continued.

The Continental Bag and Paper Company had previously owned some of the stock of the Victory company and by purchasing Mr. Pareira's holdings now has full control.

Mr. Pareira will continue to be interested in Marinette industries and he will now devote most of his time to the Reliance Paper Company of that city which manufactures paper novelties. It is expected that the Reliance company will undertake some expansion this year. Mr. Pareira came to Marinette about eight years ago and it was through his efforts that the Victory Bag and Paper Company succeeded.

When the announcement of Mr. Pareira's retirement was made to his employees last week, they received it with a show of great regret, for their employer had always devoted himself to their welfare. A banquet was then arranged in his honor. At this meeting a resolution expressing the employees' appreciation for his many kindnesses was adopted.

Robert Rogers Speaks on "Wood"

A very interesting talk and discussion on "Wood" was presented by Robert Rogers to the Kimberly-Clark Company foremen at their semi-monthly meeting this week at Niagarag, Wis. The men convened at the Kimlark Inn where they had luncheon. Mr. Rogers talked on the use of wood in the paper industry. The second in this series whereby the foremen will become more acquainted with the activities not in his general survey will be given by the foremen of the sulphite department.

General News of Wisconsin Industry

Four basketball teams from four of the Kimberly-Clark Company paper mills, located at Neenah, Kimberly, Niagara and Niagara Falls, New York, took part in a basketball tournament which was held in the Kimberly clubhouse this week. The tournament was won by Kimberly which boasts one of the fastest amateur teams in the state.

A crew of men started Saturday morning to raze the old grist mill building to make room for the erection of a new office building for the Neenah Paper Company. The building formerly was occupied by the Krueger & Lachmann Milling Company and was one of the first mills erected in Neenah.

E. A. Oberweiser left Stevens Point Sunday for New York on business for the Whiting-Plover Paper Company. Shortly after his return in a week or ten days Mr. Oberweiser and his son David, now attending school at St. Paul, will go to Los Angeles, California, to join Mrs. Oberweiser and daughter Camille who had been there since the middle of January.

Charles Trotier, formerly with the Peshtigo Paper Company, of Peshtigo, Wis., has gone to Escanaba with Mrs. Trotier where he has secured a position as millwright, for the Escanaba Paper Company.